

Journal of the Irish Dental Association

Iris Cumainn Déadach na hÉireann

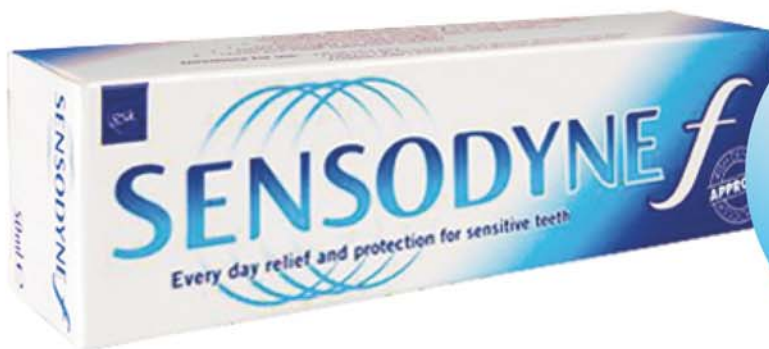


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5	EDITORIAL
6	PRESIDENT'S NEWS
8	IDA NEWS <i>Dentists give Government the 'red card'</i>
11	QUIZ
12	NEWS FEATURE <i>Economic evaluation of the DTBS</i>
15	BUSINESS NEWS <i>Industry news for dentists</i>
19	FEATURE <i>Sensodyne Sensitive Dentist of the Year</i>
23	PEER-REVIEWED ARTICLES
23	<i>Tooth agenesis in patients referred to an Irish tertiary care clinic for the developmental dental disorders</i>
28	<i>Dentists' approach to patients on anti-platelet agents and warfarin: a survey of practice</i>
32	<i>Review of methods used in the reconstruction and rehabilitation of the maxillofacial region</i>
38	ABSTRACTS <i>Abstracts from scientific papers on: Predictable management of cracked teeth with reversible pulpitis; The longevity of different restorations in primary teeth; Contradictions in the treatment of traumatic dental injuries and ways to proceed in dental trauma research; and, Platform switching and marginal bone-level alterations: the results of a randomised controlled trial.</i>
40	FACT FILE <i>Guidelines for treating patients taking bisphosphonates prior to dental extractions</i>
41	PRACTICE MANAGEMENT
41	<i>Difficult patients</i>
43	<i>Face the four big problems</i>
45	CLASSIFIED
46	DIARY OF EVENTS



Dentists give Government the 'red card'

8



Sensodyne Sensitive Dentist of the Year

19



Tooth agenesis in patients

23



Guidelines for treating patients taking bisphosphonates

40

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Dentists unite against short-sighted policies

The Irish Dental Association arranged a meeting in Croke Park (pp.8-9) on Saturday January 17 to discuss the recent Government changes to dentistry and how we might respond. The turnout was exceptional and shows how dentistry can unite and deal with the severe challenges it faces. Members had the opportunity to learn how to cope with the adversity. Great concerns were raised about the lack of support for oral health/prevention and the short-term view of the Government.

The news feature (pp.12-14) highlights the economic impact of the Dental Treatment Benefit Scheme's (DTBS) removal. The abandonment of the DTBS will cost the Irish public about €100 million in future taxes, never mind the deterioration in oral and dental health and the missed opportunity to save lives by the early detection of oral cancer.

All news is not bad and it is refreshing to read how dentistry is being incorporated in the BT Young Scientist Exhibition (p.16). It is good to have objective evidence that correction of facial form/dentoalveolar disproportion has a significant effect on the psychological health of our adolescent patients.

Patients appreciate the care we give them and the number of patients who wrote in to support their dentists in the Sensodyne Sensitive Dentist of the Year (pp.19-21) was objective evidence of the same. The winners went well beyond what would normally be expected but we believe what happens commonly. The presentation ceremony was very positive and a real pearl in the present circumstances we find ourselves in. GlaxoSmithKline deserve great commendation for their vision.

Scientific papers

The peer-reviewed papers highlight the workings of a multidisciplinary team working together in the management of developmental dental disorders (pp.23-27). The paper on 'Dentists' approach to patients on anti-platelet agents and warfarin' (pp.28-31) shows that guidelines as suggested on p.31 are urgently required for our patients. The review paper on 'Reconstruction and rehabilitation of the maxillofacial region' on pp.32-37 demonstrates what is possible in 2010 for these patients. When this is combined with oral and dental rehabilitation, the quality of life for our oral cancer rehabilitated patients is potentially great. Unfortunately there are few resources in our present Irish health scheme to fund what should be routine dental implant/maxillofacial prosthetic reconstruction for these patients.

Patients having recovered from mouth cancer are given a huge bill to fund their dental rehabilitation as this treatment is not covered by their medical card/the HSE.

The paper on 'Contradictions in the treatment of traumatic dental injuries and ways to proceed in dental trauma research' (p38) is a must for all practitioners. A most honest and revealing paper. The Quiz (pp.11 and 39) is again a great educational case for us and it is great to get the clinical answers in the privacy of our office/coffee rooms/home and potentially gain CPD points.

Our Fact File (p40) on 'Guidelines for treating patients on bisphosphonates' is in response to the number of requests from practitioners for information in this area and we hope it will address your concerns.

Practice management

Difficult patients (pp.41-42) can occasionally significantly disrupt our working lives and create unneeded stress. This article gives us some pointers on how we might deal with this event by collaboration rather than opposition but also how we must protect ourselves against compassion fatigue.

Dr Farran, who we will be hearing at the Annual Meeting in Galway, tells us how we might cope with the four biggest challenges: technology advances; the value of staff retention; working in teams; and, recognising what we can and cannot save.

I hope you enjoy this Journal as much as I did and the Editorial Board welcome your opinions.



Prof. Leo F. A. Stassen
Honorary Editor

Leo F. A. Stassen

PRESIDENT'S NEWS

Dentistry at a crossroads

IDA President Donal Blackwell highlights the Association's response to the recent Budget cuts.

Budget 2010 served a severe blow to the dental profession in Ireland with the effective abolition of the PRSI (DTBS) Scheme and a massive cut in spending for the Medical Card Scheme (DTSS).

Members reacted angrily and were in shock at these drastic changes. Despite a long, dedicated lobbying campaign, including meetings with various politicians, and in particular with Minister for Finance Brian Lenihan, and Minister for Social and Family Affairs Mary Hanafin, dramatic cuts have now been implemented.

Emergency meeting

In response to this devastating decision, an emergency meeting for members was arranged at very short notice for Sunday January 17 last at Croke Park. Over 430 dentists attended the event and it was certainly very heartening to see such an attendance. The positive upbeat atmosphere was encouraging and, I hope, boosted members' morale.

On your behalf I wish in particular to congratulate the members of the GP Committee under the Chairmanship of Dr Helen Walsh, who have worked tirelessly on behalf of the Association, and especially over the last six weeks, to respond to members regarding the Budget. Our Association is indeed lucky to have such dedicated members and I applaud each one of you. Also, a big thank you and congratulations to all staff members in IDA House for organising the event.

There is no doubt but that dentistry is indeed at a crossroads in this country. Many dental practitioners will have to make very difficult decisions in the next 12 months in order to prosper and continue in business. As an Association we are determined to ensure that the dental profession and care for dental patients thrive, and to ensure that we support your efforts, regardless of the level of support or interest forthcoming from the State.

IDA Annual Conference 2010

As you are undoubtedly aware, our Annual Conference takes place in the Radisson Hotel, Galway, from May 13-15, and I hope that the positive momentum and encouragement I saw in Croke Park will be repeated in Galway. This is an ideal opportunity to obtain all your CPD requirements for 2010 and to meet with colleagues and friends, and I urge you all to attend. Bookings are now open; for further details, please contact IDA House.

President-Elect

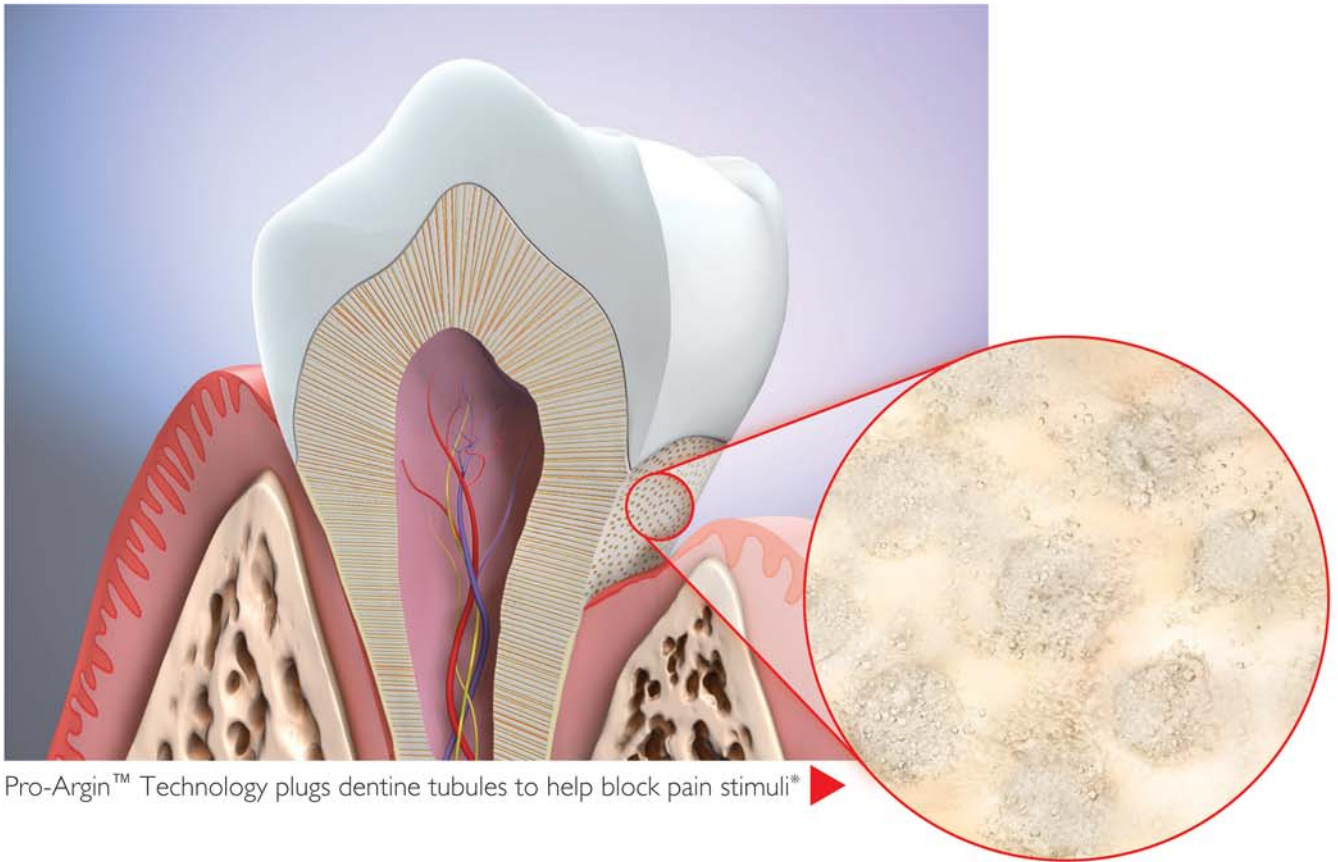
Council and I were delighted to accept the nomination from the Metro Branch of Conor McAllister for President-Elect. Conor has been a life-long member of the IDA and was Past President of the Metro Branch and a member of the GP committee. He is a very worthy candidate and I wish him every success in his new position.



Donal Blackwell,
President.



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Dentists give Government the 'red card'



Dentists give the Government the 'red card' when voting on the GP Committee's motion.



Speakers at the Conference (from left): Dr Maurice Quirke and Dr Helen Walsh of the GP Committee; Association President Dr Donal Blackwell; Chief Executive Fintan Hourihan; David McCaffrey of MedAccount; Sheila Scott, marketing consultant; Dr Susie Sanderson of the British Dental Association; and, Clare Dowling, the Association's Employment and Communications Officer.

The largest meeting of dentists ever staged in Ireland gave the Government the red card for its treatment of oral healthcare. With dentists all given a red voting card, the meeting voted on a motion put forward by the GP Committee of the Association. The motion read:

"That the General Practitioner members of the Irish Dental Association have no confidence in the current Government, and in particular in the Ministers for Health and Social Welfare, to adequately cater for the ongoing dental and oral health requirements of the citizens of this State."

It was proposed by Dr Helen Walsh, seconded by Dr Maurice Quirke, and adopted unanimously by the meeting.

Speaking at the meeting, Chief Executive Fintan Hourihan said that the Government had destroyed what minimal support it has given to dental healthcare in recent years: "The Government has targeted supports which were designed for the most vulnerable patients or for

workers who are paying for them week in and week out. The consequences will be huge for dentists and for patients alike as we roll back much of the progress we've made in recent years". Hourihan highlighted the fact that the Association had an independent economic assessment of the dental supports which proved that the supports available through the PRSI scheme save the taxpayer €3 for every €1 spent: "This proves that the cuts the Government have made do not even make economic sense".

Fintan also highlighted the reduction in the tax allowed against dental treatment; the drastic reduction in treatments allowable under the PRSI-based Dental Treatment Benefits Scheme; and, the likely 'rationing' of dental care for Medical Card holders under the Dental Treatment Services Scheme.

A significant part of the day was dedicated to action that Irish dentists



At the event were: Dr Naomi Richardn, Kilkenny; Dr Mary Reddy, Dublin; and, Dr Joanne Devereux, Arklow.



Old friends: Dr Seton Menton, Donnybrook, and Dr Enda Concannon from Malahide.



Dr Aidan McGrath and Dr Mary Rothwell of Ballinasloe with Dr Tom O'Connor of Dun Laoghaire.



Dr Anne O'Donoghue with Dr Aislinn Machesney, both from Dublin.

can take to improve their business in the light of the economic downturn, and the Government's aggressive and negative treatment of the population's oral healthcare. Dr Susie Sanderson of the British Dental Association spoke about how dentists there had coped with several significant changes to the National Health Service, starting in 1992 and continuing through to the present day. Sheila Scott, a specialist in marketing who works with many dental practices, also in the UK, outlined several things that dental practices can do to attract business. She particularly stressed the need for a web presence. In the afternoon, David McCaffrey of MedAccount went through the basics of good financial planning: how to manage costs, how to maximise your income and how to grow your business. He stressed the importance of establishing your 2009 tax liability early in 2010 and budgeting to pay it in October. Clare Dowling of the IDA

reminded dentists of the legal requirements when dealing with pay cuts, short-time working and redundancies.

Seven dental insurance or payment plan companies presented their credentials to the meeting. They were: VHI DeCare; Denplan; The Dental Plan; DPAS; Hospital Saturday Fund; Practice Plan; and Pearly Whites.

The day was brought to an end with a closed session for members. There was a lively discussion with a wide range of contributions and suggestions. All were responded to and several noted for consideration by the officers and the GP Committee. Many members expressed gratitude to the officers and committee members for their hard work. They were, in turn, encouraged to take as full a part in their branch of the Association as possible and to attend the Annual Conference in Galway in May.

IDA NEWS

Nomination for President-Elect



As we go to print, the Metropolitan Branch announced that it has nominated Dr Conor McAllister for the position of President-Elect. The National Council of the Association meets on February 6 and Dr McAllister's nomination will be put before the meeting for ratification. A well-known general practitioner, he is based in Walkinstown, Co. Dublin.

Dr Conor McAllister, the Metropolitan Branch's nomination for the position of President-Elect.

Metro Branch ASM

The Compleat Dentist

The Metropolitan Branch will hold its Annual Scientific Meeting in the D4 Hotel, Ballsbridge Court (formerly the Berkeley Court Hotel), Ballsbridge on Friday, February 26. The event, which is entitled 'The Compleat Dentist', will also include a full trade show.

Presentations at the event will cover topics such as: dental tourism; managing staff in the dental practice; preparing for a dental audit; TMJ examinations; stress in dentistry; and, much much more. For further details and booking contact IDA House.

Kerry dentist retires



Dr Denis Reen's retirement dinner took place in the Meadowlands Hotel, Tralee, Co Kerry in December. At the event were (from left): Front row: Dr Donal Blackwell, President, IDA; Mrs Barbara Reen; Dr Denis Reen; Dr Marcas MacDomhnaill; and, Dr Barry Harrington. Middle row: Dr Declan Fuller; Dr David Fuller; Dr Thomas Quilter; Dr Ivor O'Sullivan; Dr Colm O'Loughlen Jnr; Dr Bernice Fitzgibbon; Dr Thomas Twomey; Dr Peter Moran; and, Dr Maurice Lyons. Back row: Dr Colm O'Loughlen Snr; Dr William Palmer; Dr Gerry McCarthy; Dr Paul Keogh; and, Dr Dan Counihan.

Pearls of Wisdom – Annual Conference



Our Annual Conference moves west this year and will take place from May 13-15 at the Radisson Hotel, Galway. We return to the City of Tribes with an extensive scientific programme, large trade show and many many fun social events for all members of the dental team!

The emphasis this year is very firmly on the dental team and all members are encouraged to attend the event.

Well known international speakers such as Dr Howard Farran, Dr Stanley Malamed, Dr Joseph Massad, Rita Bauer and Dr Richard Mounce will present on a variety of subjects. We are also delighted to welcome back our own Irish speakers including: Dr PJ Byrne, Anne O'Donoghue, Declan Corcoran, Donal McDonnell, Paul Moore, Dymphna Daly and John Walsh. Lectures on infection control, oral radiology and medical emergencies will also be included on the programme.

A fun evening on Friday 14 will include a Dental Team Table Quiz, and all delegates are encouraged to sign up! The highlight of our social programme will be our Annual Presidential Dinner on Saturday May 15. Book today by contacting Dario in the IDA office (01-2950072).

QUIZ

Submitted by Dr Declan Corcoran.



FIGURE 1: Pre-op.

FIGURE 2: X-ray.

Question

A patient presents with gingival inflammation around an implant crown that was fitted three years ago.

What is the clinical diagnosis?

How should this problem be managed and what are the possible causes of this clinical entity?

Answers on page 39.

South Eastern's Scientific Day



The South Eastern Branch is delighted to announce details of their 50th Year Anniversary Annual Scientific meeting on Friday, February 19, at Faithlegg House Hotel, Waterford. A full day of scientific lectures will include presentations from local endodontist Dr Cormac Cullinane and Dublin-based endodontist, Dr Ray Bellamy. Dr John O'Brien will present on facial pain and Dr Maurice Fitzgerald, Waterford prosthodontist, will talk on 'Changing the occlusal vertical dimension – demystified'. Dr Caoimhin Mac Ghiolla Phadraig's presentation will be entitled 'Special care patients in primary care'. Other speakers will include Dr Traelach Tuohy and Dr Adam Jones, and dental technician Ashley Byrne.

The day will also include a full trade show followed by a wine tasting event with a local wine expert. President-Elect Dr Billy Davis will also give a presentation on what to expect at the annual conference in Galway in May. For further details and booking contact IDA House.



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NEWS FEATURE

Economic evaluation of the DTBS

DR BRENDA GANNON assesses the economic impact of removing the Dental Treatment Benefit Scheme (DTBS).

The recent proposal to remove the DTBS from public finances is based on the argument that it would save €68.4 million. This paper assesses the true costs of removing the Scheme. The DTBS is run by the Department of Social and Family Affairs and in 2008 about 1.5 million people (plus approx. 400,000 dependent spouses) – 45% of adults – were entitled to claim benefit (Irish Dental Association, 2009).

On average, an employee pays €20 a week in PRSI contributions, rising to €53 a week for higher earners. Until recently, the expectation was that they would receive one examination and two elementary cleanings annually. In addition, up to 15% discount was available to cover basic filling requirements. In 2009, 1,587,456 adults were eligible for the DTBS and 1,785,450 treatments were provided in 2008.

This paper provides a first-time assessment of the costs and benefits of the DTBS. In any cost–benefit analysis, a number of assumptions must be made and transparency is a key requirement for complete understanding of the results. This paper assumes that: there is a 10% improvement in dental health with checkups, etc., for DTBS patients; the number of adults eligible for treatment is 1,587,456; and, 30% of dentists' income is from the DTBS. Similarly, a number of limitations will mean that a precise figure for net benefit is difficult to achieve. Therefore we provide a range of scenarios. The limitations include: data is not available at individual level so only averages are assumed; assumptions are taken about the replacement of the DTBS with private care; and, the cost–benefit ratio can vary depending on main assumptions.

Evaluation

The basic tasks of any economic evaluation are to identify, measure, value and compare all costs and consequences. Although the theoretical price of a resource is its opportunity cost, the pragmatic approach to costing is to use existing market prices. The widespread use of charges (the amount paid to the provider by a third-party payer) instead of the identification of real costs is a typical example, since it is not certain that these charges reflect actual costs. Costs arise from the use of resources within the health sector, resources used by patients and families, and resources used in other sectors. Oscarson *et al* (1998) found that in the Swedish dental care sector, charges did not cover costs and hence, are not sufficient as an alternative to a more detailed cost evaluation.

The first step is identification of costs. These include health service costs, other related services, and costs incurred by patients and families. Health service costs include staff costs and consumables, capital costs, and overheads. Patient costs include out-of-pocket expenses, labour costs for caregivers, and patients' lost earnings. Indirect costs include loss of productivity and costs borne by society. They are secondary costs that relate to paid and unpaid productive work.

The second step is identification of benefits. Firstly there are health effects, e.g., cases treated, cases prevented or lives saved. Secondly, economic benefits can be direct, e.g., savings in future healthcare costs because the programme makes a person healthier. Or benefits may be indirect if individuals are unable to work. Intangible benefits include the

monetary value in reduction of pain. Thirdly, benefits may be at a societal level. The real cost of healthcare intervention is the opportunity cost – what is the loss of health outcomes if an intervention is forfeited? The aim of economic evaluation is to ensure that the benefits of a programme are greater than its opportunity cost.

Costs and benefits of the DTBS

In any cost–benefit analysis, the underlying data must be of good quality and assumptions must be transparent and appropriate. The monetary costs are calculated at approximately €68 million. Benefits include improved dental health. The main aim of government intervention in dental health is to improve overall dental health in the population and to allow access to everyone for oral examinations and basic treatments.

Poor dental health can lead to chronic conditions. Periodontal disease is used as a benchmark for poor dental health. It is associated with a range of medical conditions including coronary heart disease, stroke, and pancreatic cancer. Hence, indirect costs may be conservative if other diseases are caused to some extent by poor dental health.

In terms of benefits, we assess how much of the value of improved dental health can be attributed toward the DTBS. By applying average costs of associated diseases (heart, stroke, peripheral heart disease, pancreatic cancer) we obtain population costs for age 18 and over at €2,148,171,742. Econtech estimated the proportion of each disease that could be attributed to periodontal disease. These were 12%, 15%, 18% and 21% for heart disease, stroke, peripheral heart disease and pancreatic cancer, respectively. The total indirect costs from associated illnesses are therefore €300,806,673. By assuming that regular checkups can lead to 10% improvement in dental health, the estimated benefit for the population is €30,080,667.27. The proportion of the population eligible for the DTBS is 50%; hence, total estimated benefits in terms of improved dental health are €14,905,997.53.

The second benefit is tax revenue. Currently, the number of dentists assigned to the DTBS is 1,371, generating significant tax revenue. Withdrawal of the scheme would potentially lead to redundancies for dentists and staff. The total estimated tax contribution lost from dentists is €27,420,000.00. Similarly, the removal of the DTBS would affect employment for related staff. Overall, total tax revenue foregone would be approximately €53,622,160.59. In addition, the public finances may have to pay social welfare unemployment benefits to redundant staff. The total estimated opportunity cost is €3,963,739.33.

Finally, we assess how much people would have to pay, should the DTBS cease and should they replace it with expenditure from their own private income. While costs vary from patient to patient, this is our best estimate. The total estimated private cost is €111,835,977.44. In the scenario where we assume the half of the DTBS visits will be moved into private dental care, then the estimated cost would amount to €55,917,988.72.

The proportion of DTBS participants that are also Medical Card holders is approximately one-third. Hence, the number of Medical Card holders is about 512,000. On average a visit to the dentist costs the public finances

€56 per capita, giving a total cost of €9.6 million. This estimate is likely an underestimate, given that treatments on the DTBS scheme often cover more than that covered by the basic Medical Card.

Oral cancer is far too often detected in late stage development – the primary reason for the high death rate. The cost of treating these patients amounts to about €8,000 per year. The total cost is approximately €1.2 million. In the absence of basic dental treatment, this cost could be even higher. The advantage of the DTBS scheme is that dentists can check for signs and symptoms of oral cancer. This contributes towards the reduction in treatment costs for oral cancer if cases are detected early or if good dental health reduces the chance of diagnosis.

Cost–benefit ratio

The decision rule for cost–benefit analysis is: if the sum of benefits of an activity is greater than the sum of costs, then on efficiency grounds the activity should be undertaken. However, if there are limited funds choices have to be made as to whether or not the activity should proceed even if the net benefit is positive. The cost–benefit analysis for the DTBS shows a net benefit of €126,709,652.22 and the ratio of benefits to costs is 2.85. Thus the return on investment is 2.85 times the cost to public finances.

Further costs

Patients may travel abroad for affordable dental care for treatment which is generally expensive in their own country. If there are extensive waiting lists, patients are more likely to travel to a country where they can get top quality care at a low cost. In terms of education, the NHS in England

Table 1 Monetary benefits of DTBS

	€m
Improved general health from good dental health	14.35
Tax foregone	53.6
Social welfare payments	3.9
Private replacement costs	111.8
Medical card utilisation	9.6
Oral cancer treatment costs	1.2
Total benefits	194.45
Total monetary benefits are estimated at €194.45 million.	

estimates that it costs £170,000 from education and NHS budgets to train a new dentist. It is likely that when dental tourism and returns to education are included the benefits are even higher than suggested earlier, so we could view the cost–benefit ratio as a conservative estimate.

Sensitivity analysis

The base case scenario presented above assumed that if the DTBS is removed, then individuals will not seek private dental care and dentists will not get their work replaced by private work.

It is more likely however, that some individuals will seek private dental care, keeping the private dental market and in some cases replacing some of the DTBS work for dentists. We assume three different scenarios: (1) a quarter of the work is replaced; (2) half of the work is replaced; and, (3) three-quarters of the work is replaced. These assumptions then change the benefits in terms of revenue and health improvements. The



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NEWS FEATURE

resulting net benefits are: (1) €119.6 million; (2) €109.1 million; and, (3) 95 million, respectively. The cost-benefit ratios are: (1) 2.75; (2) 2.59; and, (3) 2.39. In all cases the ratio exceeds the value of two, meaning that benefits are at least twice the costs to the Exchequer. Another way of viewing this is to say that it is the opportunity cost to the overall finances. Removal of the DTBS may result in twice the cost eventually, and in terms of resource allocation, the costs are inevitable.

International comparisons

In other countries, the financing of dental care varies. In England, France (based on social insurance) and Sweden, universal care is provided. In Germany care is provided to those with social health insurance (88% of the population). Public expenditure on dental care varies between countries ranging from 5.7% in France to 6.9% in Germany (Eteit, S., *et al*, 2009). Patients contribute towards costs but again this varies. In France, 70% of costs are provided under social insurance, with the remainder paid by patients. In Sweden, free care is provided up to about €300. In Germany, patients pay a quarterly fee of €10 if they received care during that time. In countries where dental care is not publicly funded, private health insurance gives coverage but again this varies. Inequalities are perceived to exist in most countries, but more so in

Australia, New Zealand and Germany. Healthcare, including dental care, should be both efficient and equitable. A survey of dentists in Ireland showed that 61% dentists believe that the DTBS provides equity of access for patients who are eligible. Despite increased interest in dentistry, the number of completed cost-benefit analyses is few. In a small study in Sweden, Oscarson *et al* (2007) found that the net social benefit for caries preventative care was positive, hence benefits exceeded costs.

Conclusion

The cost-benefit analysis for DTBS shows an average net benefit of €126.8 million and the ratio of benefits to costs is approximately 2.85. This means the return on investment is about 2.85 times the cost to public finances. This estimate is likely to vary depending on assumptions about the proportion of patients that will decide to avail of private care. We estimate the net benefits to vary between €95 million and €119 million. The analysis is based on data available at an aggregate level. Individual level data would enable a more precise measure of efficiency.

Dr Brenda Gannon is a former Deputy Director of the Irish Centre for Social Gerontology with a special interest in health economics. She recently took up a new post in Sweden.

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New technology from Colgate

Colgate presented its Pro-Argin technology recently. Pro-Argin technology uses a combination of an amino acid, arginine, and an insoluble calcium compound, calcium carbonate, to seal open dentine tubules and help block the transmission of heat, cold, air and pressure stimuli to pain receptors within teeth. Colgate has added this revolutionary technology to a new product, Colgate Sensitive Pro-Relief, an in-surgery desensitising polishing paste with Pro-Argin technology.

Dentine hypersensitivity affects up to 57% of patients worldwide. Despite current treatment methods, including the use of high concentration fluoride or potassium salts, patients continue to experience dentine hypersensitivity.

Dr Nicola West, Consultant Senior Lecturer in Restorative Dentistry, Department of Oral and Dental Science, Bristol Dental School, delivered the first session, giving an overview of prevalence of dentine hypersensitivity in general dental practice. Dr West outlined the causative factors, highlighting that sufferers fall into two groups: those with healthy periodontium where the aetiology is nearly always due to wear; and periodontal patients, due to recession or post-periodontal treatment. Dr West said: "When patients present stating they have sensitivity, they are offered treatment. However, if they don't say they have sensitivity, they are usually not screened or offered treatment for dentine hypersensitivity".

Dr Mark Wolff, Chair of the Department of Cariology and Comprehensive Care and Associate Dean for Pre-doctoral Clinical Education at New York University College of Dentistry, said: "Correct diagnosis and effective treatment are critical to relieving this condition, which can seriously impact a patient's quality of life. Arginine is an amino acid naturally found in saliva that provides naturally protective oral health benefits. Latest research suggests that the positively charged arginine in the Pro-Argin technology binds to the negatively charged dentine surface and helps attract a calcium-rich layer into the dentine tubules to effectively plug and seal them. Arginine triggers occlusion of the dentine tubules, which remains intact even after exposure to acids, helping to prevent transmission of pain-producing stimuli.

Complementary toothpaste

Colgate has also introduced Colgate Sensitive Pro-Relief toothpaste, a major advance in the treatment of dentine hypersensitivity. New Colgate Sensitive Pro-Relief is the first toothpaste clinically proven to deliver instant and lasting dentine hypersensitivity relief. While most of the sensitive toothpastes currently marketed primarily numb dentine hypersensitivity pain, Colgate Sensitive Pro-Relief with Pro-Argin technology effectively plugs the channels that lead to nerves of dentine hypersensitive teeth, thereby blocking the transmission of heat, cold, air and pressure that stimulate pain receptors within teeth.

Quinn Life celebrating 10 years

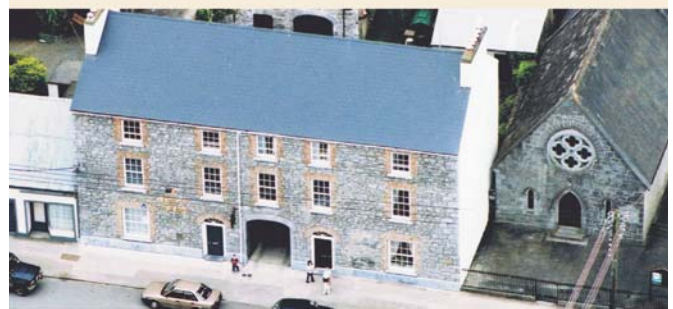
Quinn Life is celebrating 10 years in business. From the start, the company says it set out to challenge the way pensions and investments were sold in Ireland and its product range followed an index tracking approach.

"Index tracking has been proven to offer better returns over the long term," says Quinn Life's General Manager, Siobhan Gannon. "Investing in blue chip companies, across industry sectors and matching the performance of the market means you do not have the risk of so called 'expert' fund managers picking the wrong share."

Siobhan continued: "Over the past 10 years, Quinn Life has been instrumental in driving down the cost of investing by cutting out unnecessary charges. There are no lock-in or exit charges on Quinn Life investment funds and this affords the customer the flexibility to encash at any time. Aligned with a low cost ethos, Quinn Life's pensions and investments are easy to understand and transparent. Quinn Life provides customers with a comprehensive online service where they can clearly see the performance of their policy. This service offers the customer the opportunity to switch online between funds if they so wish".

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BUSINESS NEWS

First course on zygomatic implants



From left: Dr Frank Houston, Dublin Dental Hospital; Prof Chantal Malavez of the University of Brussels; Dr David Harris, Consultant Oral Surgeon at the Blackrock Clinic; and, Prof Leo Stassen, Professor of Oral/Maxillo-Facial surgery, St James's Hospital, Dublin.

A surgical team at Blackrock Clinic provided Ireland's first course on zygomatic dental implants in maxillary reconstruction using computer-guided planning software. The course was a collaborative undertaking with surgeons from Blackrock Clinic, St James's Hospital, The Dublin Dental School and the University of Brussels. This is a procedure whereby dental implants are inserted directly into the zygomatic bone, as opposed to the jawbone. Surgeons attended the course from Ireland, the UK and Canada and observed patients undergoing the procedure.

IADR (Irish Division) ASM

The International Association for Dental Research (IADR) (Irish Division) Annual Scientific Meeting was held at Thomond Park Conference Centre in Limerick towards the end of last year.

The meeting was supported by the faculty and undergraduates of the three dental schools on the island of Ireland, and also by other groups interested in dental research. Almost 50 scientific abstracts were presented over the two days and a number of prizes were awarded in various categories. A wonderful scientific and social meeting was enjoyed by the group, including an unforgettable tour of the Munster Rugby Museum and Thomond Park. This year marks the 25th anniversary of the IADR (Irish Division), and it was a pleasure for the meeting to honour distinguished founder members Professor Denis O'Mullane, Dr Seamus O'Hickey and Professor John Clarkson. The IADR (Irish Division) welcomes both undergraduate and graduate members, and indeed all those interested in dental research, and is part of the much wider International Association for Dental Research.

Young scientists get their teeth into dental research

The BT Young Scientist and Technology Exhibition kicked off this year, attracting 514 stands from 32 counties. Once again the breadth of the research was remarkable and among the projects were many innovative ideas, including dentally-focused projects. Dr Ciara Scott went along to see what our schoolchildren are finding out about teeth.

The first project to catch the eye was 'Are teenagers with glasses and braces considered less socially confident'. Inspired by the TV programme *Ugly Betty* and by their own experience of wearing appliances, Martha Fitzgerald, Jill Watson and Sinead McDonagh from Loreto College, St Stephen's Green, wanted to determine whether teenagers see peers with glasses or braces as less socially confident, and they measured this with an Implicit Association Test. This test has been used to measure unconscious bias by associating positive and negative words with other factors such as size, race and gender. It was an interesting project and their results concluded that students did rate peers with braces as less socially confident.

In the Junior section, Ronan Curran from Colaiste Ailigh, Donegal, completed a project *as gaelige* assessing the erosive effects of carbonated drinks on extracted teeth, using water as a control, with dramatic effects! Aimee McDaid from St Mary's College, Derry, investigated the acid content of drinks readily available in school. Following an earlier project that assessed the pH of carbonated drinks, Aimee measured the pH of healthy drinks such as flavoured mineral waters and fruit juices, which are now the only drinks available in school, and discovered that they are all acidic, with a pH between 3 and 5.



Ronan Curran from Colaiste Ailigh, Donegal.

Irish dentists honoured in the US



Dr's Kevin O'Boyle and Marielle Blake were conferred as Fellows of the American College of Dentists at a recent ceremony in San Antonio, Texas.

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Navan, Co Meath

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Sharon Jordan
Practice Manager
Swords Orthodontics

"I am delighted to finally see an experienced professional recruitment consultant coming into the dental industry. With increasing numbers of European dentists coming into the market, due in main to the great shortage of Irish dentists, there is a need for a specialised professional company such as Irish Dental Jobs. I am happy to be associated with this company and to work together for the betterment of dentistry as a whole."

Dr Niall J Jennings
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Dentists recognised for exceptional care

Four dentists recently received recognition for having shown professionalism and care above and beyond the normal high standard of care.



Sensodyne Sensitive Dentist of the Year Dr Freda Guiney (centre) receives her trophy from the President of the Irish Dental Association, Dr Donal Blackwell. Nuala Beecher of GlaxoSmithKline presents Dr Guiney's certificate.

The Sensodyne Sensitive Dentist of the Year award winners for 2009 were announced at a lunch in Dublin's RCSI last month. Dr Freda Guiney of Cork won the overall award while Drs James McGovern, Briony Kells and Sarah Enright were each highly commended for their work.

Decisions were made based on submissions by patients who nominated their dentists for exceptional care. Judges for the awards were Dr Barry Harrington of the Dublin Dental School and Hospital; Dr Seton Menton of Dublin; and, Dr Berna Treacy of the Public Dental Service in Cork.

Speaking at the presentation, Dr Harrington said: "Once again, this year the judges were impressed by the volume, geographical spread, and quality of the entries. For those of us who have spent a lifetime in the dental profession, it is very encouraging to read patients' testimony to the great work being done by dentists throughout Ireland. This testimony was given for a huge number of dentists and across a diverse range of cases and problems. Excellent treatment and great care were evident throughout the entries and ensured that the entries were difficult to judge.

"In the end, we made the judgements on the winning dentists, all of

whom are superb ambassadors for our profession, and our decisions are final. Let me stress that the standard required to be included in this elite group was very high. It required exceptional patient care, combined with clinical skills and great empathy, to demonstrate dental care above and beyond the norm."

Dr Donal Blackwell, President of the Irish Dental Association, congratulated all the winners and complimented GlaxoSmithKline and the *Journal of the Irish Dental Association* for their initiative in organising the Awards. He said that he felt a real sense of pride in the profession when hearing the nominations for the winners.

Overall winner Dr Freda Guiney, Cork

Dr Freda Guiney showed immense courage and professional ability when she accepted a 39-weeks-pregnant patient for treatment, late at night, on a weekend. The patient had already been told by her maternity hospital that there was nothing they could do for her facial pain. Dr Guiney's intervention, out of hours, ensured that a solution was found that could help. Dr Guiney carried out a sedative dressing on her patient on the Friday night and the following night, she carried out the first stage

FEATURE



Judging Panel Chairman Dr Barry Harrington gave the judges' overall comments and the citations for each of the winners.



Dr Enright (right) receives her certificate from Claudia Long of GlaxoSmithKline.



Dr Kells (right) receives her certificate from Amy Thomas of GlaxoSmithKline.



Liz Rowen, Director of Marketing with GlaxoSmithKline, chatting with the President, Dr Donal Blackwell, and Fintan Hourihan, Chief Executive, of the Irish Dental Association.

of a root treatment, which eased the pain. The baby was born, with mother and baby both well, on the Sunday night.

For her compassion, her willingness to see a patient in terrible pain on a weekend night, and for her ability to relieve that pain despite the complication of advanced pregnancy, Dr Guiney is the very worthy winner of the Sensodyne Sensitive Dentist of the Year Award.

Highly Commended

Dr Sarah Enright, Dublin

Dr Sarah Enright, who practices in Dublin and Kildare, treated a deaf patient who has had several dentists in the past. While all are acknowledged by the patient as having done a good job, Dr Enright went to extra lengths to ensure that her patient understood what was happening. In doing so, she showed a very special and sympathetic understanding of her patient's needs, especially in the way in which Dr Enright communicated with her patient.

Highly Commended

Dr Briony Kells

Dr Briony Kells faced a patient with such fear of dental treatment that she would not even go upstairs to the practice rooms when she first arrived at the practice. It took 40 minutes of reassurance from Dr Kells before, later that day, the patient returned and accepted the treatment. Dr Kells displayed patience, and worked on a professional assessment that the woman could be treated despite her almost debilitating fear, that went well beyond the norms of counselling patients. It was an extraordinary demonstration of professionalism that Dr Kells gave so much to her patient.

Highly Commended

Dr James McGovern, Galway

Dr James McGovern is highly commended for his treatment of a family of patients. The mother describes herself as nervous and



IDA President Dr Donal Blackwell congratulates the winners.



Dr Freda Guiney with Nuala Beecher from GlaxoSmithKline.



The event took place in the Royal College of Surgeons on St Stephen's Green in Dublin.



Deputy Chief Executive of the Irish Dental Association, Elaine Hughes, with Honorary Editor of the Journal of the Irish Dental Association, Professor Leo Stassen, and Chairman of the Judging Panel, Dr Barry Harrington.

having a very low pain threshold. Through his professional and personal manner, Dr McGovern managed to relax his patient to the point where she could accept the necessary treatment. Meanwhile, her three children have progressed through his practice from milk teeth to braces "without dread, fear and with the least amount of discomfort".

Dr McGovern not only successfully met the challenge of treating a

patient who had great fear, but he managed to treat her children in such a way that her fear was not transferred to them. This is a difficult challenge for many dentists and one which Dr McGovern seems to have dealt with in a way that is representative of the very best in long-term oral healthcare.

The Highly Commended certificate will be presented to Dr McGovern in his practice as he was unable to attend the ceremony.

Nominator's prize

Nuala Beecher, Product Manager, Therapeutic Oralcare, with GlaxoSmithKline announced that the winning nominator, Ciaran Cunningham, and his family will receive a prize of a holiday in Florida. It was Ciaran's wife Mary who was the 39-weeks-pregnant patient accepted for treatment on a Friday night by Dr Guiney.

Donation to charity

In addition to receiving the trophy and certificate for being the 2009 Sensitive Dentist of the Year, Dr Guiney was also able to nominate a charity to receive a donation. She nominated the International Orphanage Development Fund, which received a cheque for €1,000 from GlaxoSmithKline, makers of Sensodyne.



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Tooth agenesis in patients referred to an Irish tertiary care clinic for the developmental dental disorders

Journal of the Irish Dental Association 2009; 56 (1): 23-27.

Précis

Hypodontia is the most common developmental disorder affecting teeth, and the mandibular second premolar is the most frequently absent tooth type.

Abstract

Purpose: This study was carried out to determine the prevalence, severity and pattern of hypodontia in Irish patients referred to a tertiary care clinic for developmental dental disorders.

Materials and methods: Details of 168 patients with hypodontia referred during the period 2002-2006 were entered in a database designed as a national record. Tooth charting was completed using clinical and radiographic examinations. The age of patients ranged from 7-50 years, with a median age of 20 years (Mean: 21.79; SD: 8.005).

Results: Hypodontia referrals constituted 65.5% of the total referrals. Females were more commonly affected than males with a ratio of 1.3:1. The number of referrals reflected the population density in this area; the majority were referrals from the public dental service. Mandibular second premolars were the most commonly missing teeth, followed by maxillary second premolars and maxillary lateral incisors; maxillary central incisors were the least affected. Symmetry of tooth agenesis between the right and left sides was an evident feature. Slightly more teeth were missing on the left side ($n = 725$) than on the right side ($n = 706$) and in the maxillary arch ($n = 768$) as compared to the mandibular arch ($n = 663$). Some 54% of patients had severe hypodontia with more than six teeth missing; 32% had moderate hypodontia, with four to six teeth missing. The most common pattern of tooth agenesis was four missing teeth.

Conclusion: Hypodontia was a common presentation in a population referred to this tertiary care clinic. The pattern and distribution of tooth agenesis in Irish patients appears to follow the patterns reported in the literature.

Introduction

Hypodontia is the term used to describe the developmental absence of one or more primary or secondary teeth, excluding the third molars. It is the most common developmental dental anomaly and can be challenging to manage clinically.¹ Generally, hypodontia refers to the condition where there is absence of one or a few teeth only. Oligodontia is the term usually used to describe six or more missing teeth, and anodontia is the complete absence of teeth (Figures 1 and 2).

Hypodontia can also be classified, according to the severity of the condition, as:

- mild: one to three teeth developmentally missing;
- moderate: four to six teeth developmentally missing; and,
- severe: more than six teeth developmentally missing.

Hypodontia can affect both the primary and permanent dentition. It is rare in the primary dentition, with a prevalence of less than 1%

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PEER-REVIEWED ARTICLE



FIGURE 1: Clinical photograph of a 21-year-old male with severe hypodontia. He is missing 15, 14, 12, 22, 23, 24, 25, 35, 34, 32, 41 and 42 (12 in total). He also has over-retained and submerged primary molars, and a transposition of teeth 44 and 43.



FIGURE 2: Orthopantomogram of the same patient.

in Caucasians. When it does occur in the primary dentition, it most commonly involves the mandibular incisors.²

Aetiology

Developmental absence of teeth is a consequence of:

- physical obstruction or disruption of the dental lamina;
- space limitation;
- functional abnormalities of the dental epithelium; or,
- failure of initiation of the underlying mesenchyme.³

Hypodontia may arise as a familial condition, with a high proportion of affected individuals coming from families with a previous history of the condition.⁴ The nature of the inheritance is complex and not well understood, but it is thought to be related to more than one gene.^{5,6} Hypodontia may also arise in individuals with no family history.

A number of systemic conditions, such as hypohidrotic ectodermal dysplasia, Down syndrome and chondroectodermal dysplasia have hypodontia as a feature. The developmental disruption due to the presence of a cleft lip and palate involving the alveolus may also result in an absence of teeth in that region, notably the maxillary lateral incisors.^{7,8}

Teeth develop as appendages of the embryonic surface epithelium. The most important events during regulation of the development of all such organs are the so-called inductive interactions.⁶ Signal molecules of several different families are used sequentially during the advancing development, and reciprocally from epithelium to mesenchyme and vice versa. Signalling interactions that determine the location, identity, size, and shape of teeth take place during the early stages of tooth development. The first signals are secreted by the oral ectoderm, which initiates the odontogenic programme in the underlying neural crest-derived mesenchyme. The committed mesenchyme signals back to the epithelium and controls the growth

and folding of the epithelium. The mesenchymal signals also induce the formation of signalling centres in the epithelium, in which many genes encoding signal molecules are activated. These centres signal back to mesenchyme, as well as within the epithelium, and regulate the advancing development, including cusp development in molars. Numerous transcription factors have been identified, which are turned on in the target tissues as a result of signalling.

Prevalence

Studies assessing hypodontia vary widely in their reports of prevalence in the permanent dentition, as can be seen in **Table 1**. The majority of these studies report prevalence rates varying from 2.6% in Saudi Arabia⁹ to 11.3% in Ireland.¹⁰ Studies in the United Kingdom suggest a prevalence rate of 4-4.5%.^{11,12} Some of these studies are biased because of the nature of the population studied, i.e., orthodontic patients, and hence these figures cannot be generalised for the whole population.

Management

The developmental absence of teeth can seriously disable a young person, both physically and emotionally, especially during the turbulent years of adolescence. Early management is indicated, yet there are reports of patients with hypodontia being referred late with all that that implies – treatment disrupting the examination years and reluctance to wear appliances because of the impact on the young person's social life.¹³

There is much to be gained from the interdisciplinary management of young people who have hypodontia. Many patients are looked after by multidisciplinary teams, and each clinician does their own treatment in isolation. True interdisciplinary working involves the close working of a committed team where each member contributes their expertise to achieve an optimum outcome for the patient and their family.^{3,13,14}

Table 1: Previous hypodontia prevalence studies.¹

Country	Author	Population type	Age range (yr)	Number of patients	Prevalence (%)	Most frequently absent tooth
Malaysia	Nik-Hussein, 1989	Children attending the dental hospital	6-15	1,583	2.8%	Maxillary lateral Incisor
Saudi Arabia	Salama and Abdel-Megid, 1994	Children attending the dental hospital.	5-10	1,300	2.6%	Mandibular second premolar
Australia	Lynham, 1990	Australian defence force recruits	16-26	662	6.3%	Maxillary lateral incisor
Norway	Aasheim and Ogaard, 1993	Schoolchildren	7.8-10.4	1,953	6.5%	Mandibular second premolar
Iceland	Johannsdottir <i>et al</i> , 1997	Schoolchildren	6	396	5%	Mandibular second premolar
Denmark	Rolling, 1980	Schoolchildren	9-10	3,325	7.8%	Maxillary second premolar
Hong Kong	Davis, 1987	Schoolchildren	12	1,093	6.9%	Mandibular incisor
Ireland	O'Dowling and McNamara, 1990	Orthodontic patients	7-17	3,056	11.3%	Mandibular second premolar
England	Rose, 1966	Orthodontic patients	7-14	6,000	4.3%	Mandibular second premolar
England	Brook, 1974	Nursery and schoolchildren	3-5 & 11-14	958 & 1,183	4.4%	Mandibular second premolar
United States	Muller <i>et al</i> , 1970	School students	11-15	14,940	3.5%	Mandibular second premolar
Sweden	Bergstrom, 1977	Schoolchildren	8-9	2,589	7.4%	Mandibular second premolar

Background

Prior to 2001 the treatment of patients with developmental dental disorders in Ireland depended on the region where the patient was resident and was not co-ordinated. In December 2001 a Special Dental Needs Restorative Dentistry Clinic was established and funded by the Department of Health and Children to treat this patient population.

The purpose of this study is to identify the prevalence, frequency, severity, and geographic distribution of hypodontia cases referred to a tertiary care centre for developmental dental disorders, where an interdisciplinary approach for the management of such cases is currently available.

Materials and methods

The details of 168 patients with hypodontia referred to the Special Dental Needs Clinic in the Dublin Dental School and Hospital were entered into an Access Microsoft database designed as a national record for patients with developmental dental disorders, which included hypodontia, amelogenesis imperfecta, and dentinogenesis imperfecta. Ethical approval was obtained from the Faculty Research Committee in Trinity College Dublin and informed consent obtained from each patient or parent. Teeth charting was completed using both clinical examination and orthopantomographs. All data were entered by one investigator.

The Special Dental Needs Clinic is specifically for the treatment of patients with developmental craniofacial and dental anomalies. The main categories include:

1. Dental anomalies:

- moderate and severe developmental hypodontia;
- amelogenesis imperfecta;
- dentinogenesis imperfecta;

- microdontia/macrodontia (anomalies of tooth structure, size or eruption); and,
- failures of eruption.

2. Developmental disorders with associated craniofacial/dental anomalies:

- osteogenesis imperfecta;
- epidermolysis bullosa – recessive dystrophic type;
- ectodermal dysplasias; and,
- cleidocranial dysplasia.

Results

Referred cases

Of all patients referred to the clinic, hypodontia cases constituted 65.5% of referrals, amelogenesis imperfecta cases represented 28.5%, and dentinogenesis imperfecta cases represented 6% of the total referrals. This paper will only describe the hypodontia population.

Sex distribution

Females were more affected than males with a ratio of approximately 1.3:1.

Source of referrals

Most referrals were from the Dublin North East and Dublin Mid-Leinster areas, with fewer referrals coming from the west and south of the country (Figure 3). The majority of referrals were from the Health Service Executive (previously known as the Health Board Dental Service), followed by referrals from general dental practitioners (Figure 4). Very few cases had been self-referred or referred by a general medical practitioner.

PEER-REVIEWED ARTICLE

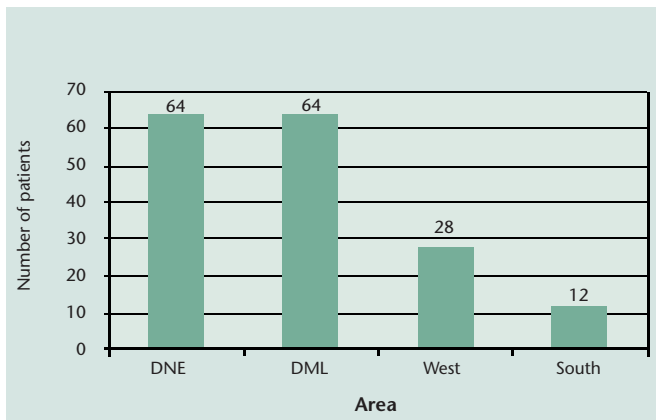


FIGURE 3: Geographic distribution of total referrals of hypodontia cases. DNE: Dublin North-East; DML: Dublin Mid-Leinster; West: West of Ireland; South: South of Ireland.

Pattern of tooth agenesis

The mandibular second premolars showed the highest frequency of tooth agenesis, representing 15% of the total number of missing teeth, followed by the maxillary second premolars (14.4%) and the lateral incisors (13%). The distribution of tooth agenesis is shown in **Figure 5**. The total number of missing teeth for all patients was 1,431, with a range of two to 26. Symmetry of tooth agenesis of the right and left sides was a feature in individual patients; however, more teeth were missing on the left side ($n = 725$) as compared to the right side ($n = 706$), and in the maxillary arch ($n = 768$) as compared to the mandibular arch ($n = 663$). The most common pattern of tooth agenesis per patient was four missing teeth, followed by two missing teeth per patient. A total of 91 patients (54%) had severe hypodontia, where more than six teeth were developmentally missing, and 54 patients (32%) had moderate hypodontia, where four to six teeth were developmentally missing.

Discussion

Hypodontia was the most common developmental dental disorder referred to the Special Dental Needs Clinic since its inception in 2001. By definition, this patient population is biased and does not reflect the prevalence and severity of hypodontia for the Irish population. The results should be interpreted bearing this limitation in mind.

In agreement with other studies,^{10-13,16-18} females were more commonly affected than males; this may suggest a referral bias, as females are more likely to seek dental treatment than their male counterparts.

The majority of referrals came from the Health Service Executive and were from in and around the Dublin area. This may reflect the density of the population in this area as 50.6% of the population lives in the Dublin Mid-Leinster and Dublin North East areas, whereas 25.5% lives in the south and 24% lives in the west of the country.¹⁵

The age range was seven to 50 years, with a median age of 20 years (mean: 21.79; SD: 8.005). To exclude other causes of tooth loss for older patients, clinical notes and referral letters were checked carefully, and compared with previous radiographs available in the charts. While recognition of the younger patients with hypodontia results either

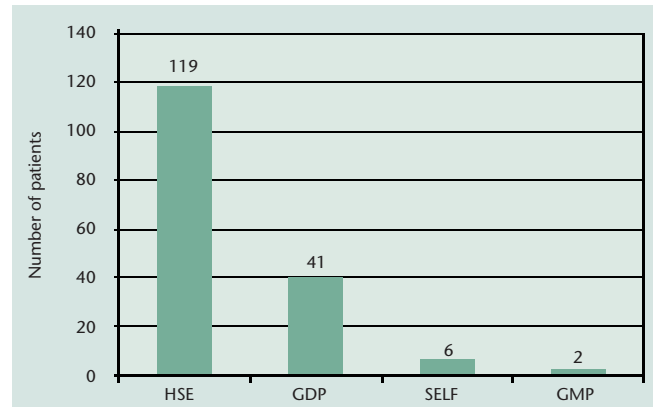


FIGURE 4: Referral sources of hypodontia cases. HSE: Health Service Executive; GDP: general dental practitioner; GMP: general medical practitioner.

from chance observation or a positive family history, it might be expected that the majority of cases would be identified in the mixed dentition phase. The median age of this patient population is 20 years; this may suggest either poor recognition by dental practitioners, or low levels of patient demand due to the prohibitively expensive cost of treatment. For these cases, it is likely that there were difficulties in locating an appropriate clinic to which a referral for advice or treatment would be made. A second possible reason is that the database was established by the Division of Restorative Dentistry and Periodontology, which traditionally provides restorative care at the end of the treatment plan, as compared to the interdisciplinary approach that has been implemented recently. Patients are now being added to the database as soon as their diagnosis is confirmed, often on referral from paediatric dentistry, community and orthodontic clinics, and a treatment plan drawn up in interdisciplinary clinics.

The frequency and distribution of tooth agenesis (as shown in **Figure 5**) is similar to that reported by other workers;^{12,13,16-18} however, a slight increase in the prevalence of missing maxillary second premolars as compared to maxillary lateral incisors was noticed. This may be attributed to the fact that the majority of these patients are referred because of moderate to severe hypodontia and that mild hypodontia cases, where there were no additional features like microdontia, impactions, or failure of eruption, were not referred but treated locally. Our results were also in agreement with the results of a Swedish study.¹⁴ However, that group reported an increased prevalence of mandibular central incisor aplasia and did not report any agenesis of maxillary central incisors.

The most frequently reported number of missing teeth was four missing teeth per patient, followed by two missing teeth per patient (as shown in **Figure 6**).

The Special Dental Needs Clinic is a specialist clinic and hence most of the cases referred had moderate to severe hypodontia with four or more teeth missing (**Figure 7**); some mild cases were also treated when additional features such as microdontia, impacted teeth, or primary failure of eruption, which may complicate the management of such mild cases, co-existed.

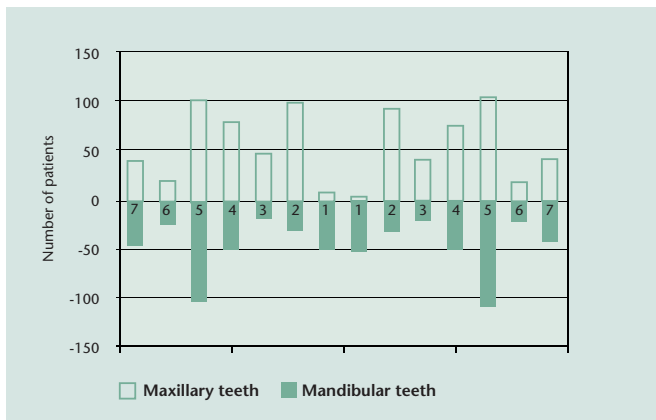


FIGURE 5: Frequency and distribution of congenitally missing teeth.

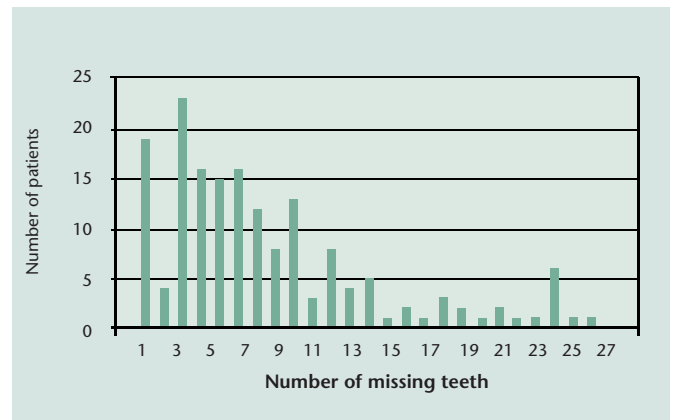


FIGURE 6: Number of missing teeth per patient.

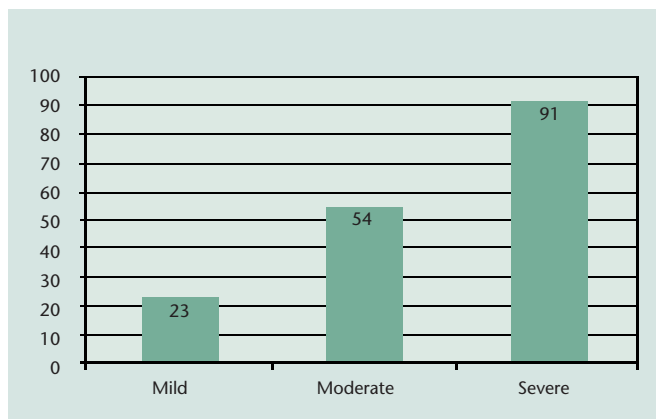


FIGURE 7: Number of cases in relation to severity of tooth agenesis.

Conclusion

This paper describes the profile of patients with hypodontia attending a tertiary care clinic for developmental dental disorders in the Dublin Dental School & Hospital. Hypodontia is the most common developmental disorder affecting teeth in this referred population. The range of missing teeth was two to 26, and the mandibular second premolar was the most frequently absent tooth type.

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Dentists' approach to patients on anti-platelet agents and warfarin: a survey of practice

Précis: A lack of adherence to current guidelines is seen in the operative management of patients on anti-platelet agents and/or warfarin.

Abstract: In everyday practice, dentists are confronted with the dilemma of patients on anti-platelet agents and warfarin who require invasive dental procedures and, more pertinently, dental extractions. There may be a divergence of opinion among dentists regarding how they manage these patients.

Aims: To assess general dental practitioners' approach to the management of patients taking anti-platelet agents and/or warfarin who are undergoing invasive dental procedures.

Methods and data: A semi-structured questionnaire was designed to survey general dental practitioners in a large Irish urban area.

Results: A response rate of 89% was achieved in a study population of 54 general dental practitioners. A total of 25% of respondents who carry out extractions on warfarinised patients do not check the INR prior to invasive dental procedures. Some 90% of respondents stop anti-platelet agents prior to extractions.

Conclusions: A significant proportion of respondents fail to check warfarinised patients' INR prior to invasive dental procedures. Furthermore, a trend of stopping anti-platelet agents was noted, which is in contrast with current recommendations in the dental literature. Certain practices in this small study population proved alarming and highlight the need for improved awareness of current guidelines. A further large-scale study may be justified, as variation in practice may have clinical and medico-legal repercussions.

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Introduction

Various anti-platelet agents may be encountered in everyday dental practice; these are often used in combination thus compounding their potential to cause post-operative haemorrhage. Aspirin and clopidogrel are increasingly used in combination following vascular stenting procedures; they work by irreversibly inhibiting platelet aggregation, an effect that lasts for the duration of the life span of the platelet, typically seven to 10 days.¹ Dipyridamole can be combined with aspirin for stroke prevention.² It must be noted that many other agents may alter platelet function including other non-steroidal anti-inflammatory drugs (NSAIDs), heparin, antimicrobials, selective serotonin reuptake inhibitors (SSRIs), herbal supplements, and cardiovascular agents such as diltiazem, propranolol, furosemide, and nifedipine.³

A major concern among dental practitioners

is the potential for excessive bleeding after invasive dental procedures and this often prompts them to stop long-term, low-dose anti-platelet therapy.⁴ Interestingly, studies have failed to demonstrate prolonged or excessive post-operative haemorrhage attributable to anti-platelet agents following simple dental extractions when compared to non-medicated controls.^{5,6} There are published studies highlighting the inherent danger of interrupting both anti-platelet and anti-coagulant therapy.^{7,8,9} One study concluded that patients who had clopidogrel therapy interrupted following coronary artery stenting were up to ten times more likely to die or to be re-hospitalised compared to patients who had continuous therapy.⁷ It has been estimated that the thrombotic risk is one in 21,448 cases when aspirin therapy is withheld.⁸ Some authors suspect the existence of a

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biological platelet rebound phenomenon when aspirin therapy is interrupted; this creates a pro-thrombotic state that may ultimately lead to a fatal thrombo-embolic event.^{10,11}

Patients on warfarin pose unique management challenges when the integrity of the vascular system is compromised. Warfarin works via the inhibition of the vitamin K-dependent coagulation factors: factors II, VII, IX, X, protein C, and protein S.¹² Thus the coagulation cascade is affected in a manner that hinders thrombus formation. Warfarin is used therapeutically in patients with an increased risk of thrombo-embolism such as those with atrial fibrillation, patients with prosthetic heart valves, and patients with prior pulmonary embolism.¹³ Patients on warfarin often have prolonged bleeding, a trait that has led to the relatively common practice of unnecessarily adjusting patients' warfarin dose in the days prior to an extraction. It should be acknowledged that warfarin has an intended therapeutic effect and, despite the distress of prolonged or possibly heavy bleeding, a thrombo-embolic event is potentially fatal. The practice of adjusting a patient's warfarin regime prior to invasive dental treatment is a result of studies carried out between the 1940s and 1980.¹⁴ During this era, a patient's degree of anticoagulation was measured using the prothrombin time, which is relatively poorly standardised between laboratories. The International Normalised Ratio (INR) was introduced in 1983 by the World Health Organisation to effect a standardisation of the prothrombin time and, subsequently, optimal therapeutic ranges for anticoagulation were established. This directly led to a decrease in patients' anticoagulation levels and a concurrent decrease in the incidence of morbidity from iatrogenic bleeding.^{14,15} Despite this improvement, many dentists still have reservations in treating the warfarinised patient. One study recently reported that 9% of general dental practitioners in the study did not treat patients on warfarin for "a variety of reasons".¹⁶ With the population-wide cardiovascular sequelae of ageing, general dental practitioners will be treating patients on warfarin more frequently.

With regard to the potential for bleeding in this cohort of patients, it has been stated that approximately 90% of post-extraction haemorrhage originates from sources other than the patient's anticoagulant.¹⁷ Prolonged or excessive bleeding can be minimised by reducing intra-operative trauma, delivering clear post-operative instructions both verbally and in written form, and avoiding inappropriate prescribing of NSAIDs. Local measures can be used successfully to control bleeding following an extraction and practical advice includes performing dental extractions at the beginning of the day and week. Tranexamic acid, an anti-fibrinolytic agent, has been shown to be of value in preventing haemorrhage post extraction in patients taking warfarin when given via a mouthwash, yet this agent is not available in general dental practice.¹⁸ Finally, patients taking warfarin should not be prescribed NSAIDs as analgesic agents because these agents act as reversible inhibitors of thromboxane production in platelets and hence increase post-operative bleeding; this fact also applies to COX-2 inhibitors.

Objectives

The objective of this study was to assess the management of patients on anti-platelet agents and warfarin by general dental practitioners in a large urban area in Ireland.

Materials and methods

A semi-structured questionnaire was developed to assess how dentists manage patients who take anti-platelet agents or warfarin. To assess validity, the questionnaire was piloted on five general dental practitioners with a cumulative experience of 65 years in dental practice. Using their feedback, the questionnaire was revised and these dentists were re-administered the questionnaire and included in the study. Thirty general dental practices were selected at random from the telephone directory and all the dental practitioners in these practices were asked to complete the questionnaire. Between July and August 2008, 54 questionnaires were personally delivered to and collected from the respondents in sealed envelopes to ensure anonymity. Forty-eight completed questionnaires were returned and the data were recorded in a database and analysed using Microsoft Access™ and SPSS™.

Results

Anti-platelet agents

As seen in **Figure 1**, 10% (n = 5) of respondents never stop anti-platelet agents prior to dental extraction. Some 23% (n = 11) always stop anti-platelet agents prior to dental extraction and the majority do so in conjunction with the patient's general medical practitioner. Those who always stop anti-platelet agents do so for a mean of 3.6 (range 2-7) days prior to extraction. Furthermore, five respondents in this group advise their patients to stop taking anti-platelet agents for a mean of 1.8 (range 1-3) days post extraction. The remaining 67% (n = 32) of respondents replied that they sometimes stop anti-platelet agents. Some 7% (n = 3) of respondents who stop patients' anti-platelet agents prior to extractions always do so without prior consultation with the patient's medical practitioner.

Warfarin

A total of 92% (n = 44) of respondents carry out extractions on patients taking warfarin, as seen in **Figure 2**. Some 25% (n = 11) of those reported that they did so without checking the patient's INR prior to extraction. Of those who do attempt to check the patient's INR, 21% (n = 7) have the patient's INR checked more than 72 hours prior to extraction. The mean upper INR limit at which respondents would carry out extractions was 3.2 (range 2-4).

Discussion

Every year it is estimated that about 800,000 people worldwide undergo a non-surgical coronary artery interventional procedure and most patients with stents are maintained on an anti-platelet regimen.¹⁹ It is therefore extremely likely that dental practitioners will encounter these patients on a regular basis. The management of patients on anti-platelet agents requiring extractions in primary dental care may be both inappropriate and inconsistent, as demonstrated by our limited study. The majority of respondents prefer to stop patients' anti-platelet agents prior to extraction. This practice is at variance with the current literature, which argues that the interruption of therapy may expose such patients to an increased risk of developing adverse cardiovascular events.²⁰

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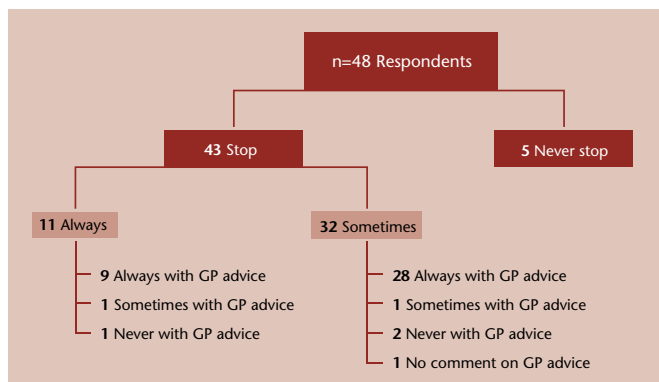


FIGURE 1: Respondents' approach to stopping anti-platelet agents for extractions.

This study showed that of those dentists who stop anti-platelet agents, 86% do so in conjunction with the patient's medical practitioner. The decision to interrupt therapy is often arrived at following discussion with the patient's general medical practitioner or cardiologist, a person whose decision may be based on their experience in general surgery or orthopaedic surgery.⁹ If advice from general medical practitioners is at variance from the current guidelines, one should consider consulting the patient's cardiologist. It is proposed that the study population's practice of withdrawing therapy is based on evidence other than current guidelines from the dental literature. Furthermore, the practice of withholding anti-platelet agents in the post-operative period has no foundation in the current literature and should be strongly discouraged.²¹ Recommendations for the management of dental patients on anti-platelet agents are seen in **Table 1**.

In 2007, the British Committee for Standards in Haematology (BCSH) Task Force on Haemostasis and Thrombosis, together with the British Dental Association and the National Patient Safety Agency, developed evidence-based guidelines for managing patients on warfarin.²² The guidelines clearly state that the risk of significant bleeding in patients taking warfarin and with a stable INR of ≤ 4 is very small. The guidelines stress that the risk of thrombosis may be increased in patients whose warfarin is stopped prior to dental surgery. Indeed, fatalities due to thrombo-embolic events have been documented as a result of stopping warfarin prior to invasive dental surgery.²³ Potentially fatal haemorrhages may occur in procedures, including dental extractions, be they simple or surgical, periodontal treatment including sub-gingival scaling and root planing, subgingival restorations, inferior alveolar nerve blocks, biopsies and, in theory, endodontic treatment.

Complicated management situations arise in the following circumstances: when patients are on both warfarin and anti-platelet agents; when a patient has a disease that modifies the pharmacokinetics of warfarin such as chronic liver or kidney disease; or, when a patient has a bleeding disorder. Referral to a dental hospital or maxillofacial surgery unit is advisable for this group of patients.²⁴ The guidelines unambiguously state that the patient should have his or her INR measured within the 72 hours preceding the procedure and ideally within 24 hours.⁹ This study revealed that this guideline was not adhered to by 41% of respondents. The patient's INR record book may be

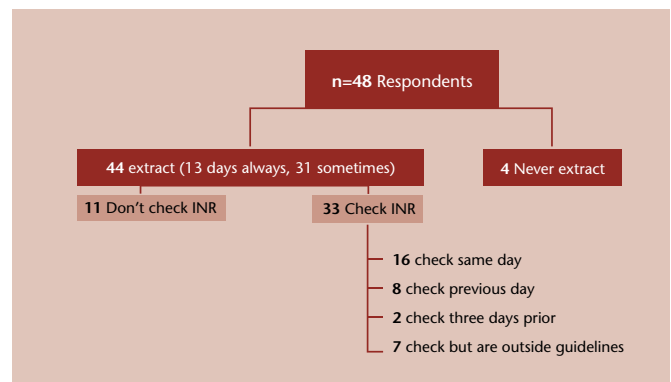


FIGURE 2: Respondents' approach to extractions and pre-procedure monitoring in patients on warfarin.

referenced, yet it is not sufficient to carry out an invasive dental procedure based on such information unless the patient's last entry was within 72 hours. **Table 2** contains recommendations for the management of dental patients on warfarin.

This study had several weaknesses. One was the small sample size, which always limits the value of reporting the means in a descriptive analysis. A further weakness was the design of the questionnaire. The question: "Do you check the patient's INR (International Normalised Ratio) pre dental extraction?" may have been ambiguous and led to an artefactually high negative response rate. Those that responded in the negative may have interpreted the question as meaning: "Do you personally check the INR in-office?" However, we feel that the way the question was phrased was in a colloquially acceptable and unambiguous manner, so likely had minimal impact on the overall results.

Conclusion

In conclusion, general dental practitioners in this study population display a wide range of practice in their approach to patients on anti-platelet agents and warfarin. A trend towards overly conservative management is seen in the former. In contrast, the approach to the warfarinised patient would appear to be haphazard, with 25% of those that extract never checking the INR in the immediate pre-operative period. There is a clear need for greater awareness of an evidence-based approach to the dental management of this unique patient group to avoid unnecessary and preventable complications.

Acknowledgement

We would like to extend our gratitude to the respondents who took time to fill out our survey.

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Table 1: Recommendations for the management of patients on anti-platelet agents.**Patients on a single anti-platelet agent**

- Do not stop for dental procedures

Patients on concurrent aspirin and dipyridamole

- Do not stop for dental procedures

Patients on concurrent aspirin and clopidogrel

- Consult with the patient's cardiologist
- Patient may need referral to the dental hospital for the invasive dental procedure

Adapted from: **Randall, C., (ed.).** *Surgical management of the primary care dental patient on antiplatelet medication.* 2007. A guideline revision is due in late 2009 and will be available at: <http://www.ukmi.nhs.uk/activities/specialistServices/>.

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Table 2: Recommendations for the management of patients on warfarin.**Pre-operative**

- Check INR within 72 hours of proposed invasive dental procedure (do not proceed unless the INR is checked)
- Primary dental care practitioners should never instruct a patient to stop their warfarin
- Plan the invasive procedure for the start of the week and/or the beginning of the day

Intra-operative

- It is safe to proceed with the following invasive dental procedures if the INR is ≤ 4 :
 - local anaesthetic administration, including inferior dental nerve blocks;
 - single and multiple extractions;
 - minor oral surgical procedures;
 - periodontal treatment, including surgery;
 - biopsy; and,
 - endodontic treatment.
- Minimise operative trauma
- Sutures and oxidised cellulose (Surgicel™, etc.) are suitable adjuncts to achieve haemostasis

Post-operative

- Do not prescribe NSAIDs or aspirin
- If prescribing a course of antibiotics (not including a single prophylactic dose), the INR needs to be checked 72 hours after first dose.

Adapted from: **Perry, D.J., Nokes, T.J.C., Heliwell, P.S.** *British Committee for Standards in Haematology Guidelines for the management of patients on oral anticoagulants requiring dental surgery.* 2007. Available from: <http://www.bcshguidelines.com/pdf/WarfarinandOralSurgery26407.pdf>

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Review of methods used in the reconstruction and rehabilitation of the maxillofacial region

Précis

Modern methods in the reconstruction and rehabilitation of the maxillofacial region.

Abstract

Maxillofacial and dental defects often have detrimental effects on patient health and appearance. A holistic approach of restoring lost dentition along with bone and soft tissue is now the standard treatment of these defects. Recent improvements in reconstructive techniques, especially osseointegration, microvascular free tissue transfer, and improvements in bone engineering, have yielded excellent functional and aesthetic outcomes. This article reviews the literature on these modern reconstructive and rehabilitation techniques.

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Introduction

Reconstructive maxillofacial surgery refers to the wide range of procedures designed to rebuild or enhance soft or hard tissue structures of the maxillofacial region. Reconstruction of jaw and mouth defects represents a challenge to the surgeon¹⁻⁵ and is most commonly indicated in patients with oral squamous cell carcinoma (SCC). It is also employed in cases of benign tumours, trauma, osteoradionecrosis, infection, chronic non-union of bone, clefts, congenital deformities and old age.^{5,6,7} The development of antibiotics, improved diagnostic imaging and anaesthesia has heralded a new era of success in maxillofacial reconstruction.^{1,2,4,6} In the past 20 years, the development of bone technology,⁸⁻¹² osseointegration,¹³⁻¹⁷ microsurgery^{7,18,19} and improved dental prosthetics has revolutionised maxillofacial reconstruction. Following surgery, early wound closure and the restoration of form, cosmetics and function are the goals of reconstructive surgery.^{1,6} This article seeks to review the modern methods employed in the reconstruction and rehabilitation of the form and function of the jaws and mouth, such as free tissue transfer, prosthodontics and dental implants.

Reconstruction

Maxillofacial reconstruction is of prime importance in the management of orofacial defects caused by disorders such as neoplastic disease. The modern techniques for reconstruction are discussed below.

Vascularised free tissue transfer

Vascularised free tissue transfer (VFTT), also known as free flap transfer, is now considered the gold standard for maxillofacial reconstruction.^{4,6} It involves the harvesting and detachment of tissue with its blood and nerve supply and transferring it to repair a defect, where its blood and nerve supply are re-established by re-anastomosis to suitable recipient site vessels.⁶ Success rates are estimated at between 90% and 94%.²⁰⁻²² VFTT is advantageous over non-vascularised transfer, as post-operative radiation affects the vascularised flap less severely compared to the non-vascularised flap. A number of different donor sites are used for VFTT, the selection of which depends on the recipient site location and the type of tissue being replaced.^{5,6,7,13,18,20-30} The principal types of flaps used in reconstruction are discussed below.

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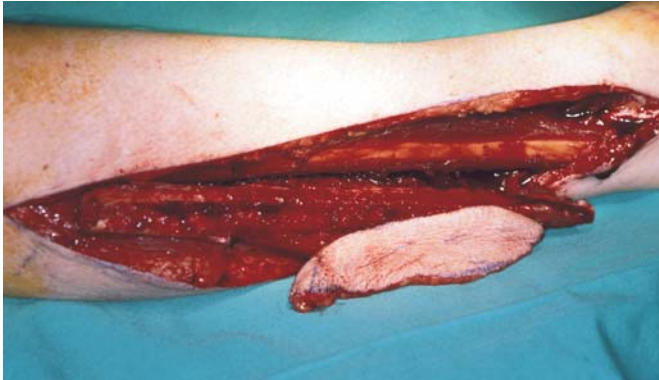


FIGURE 1: Fibula free flap at harvest site. (Image courtesy of Mr Gerard Smith.)

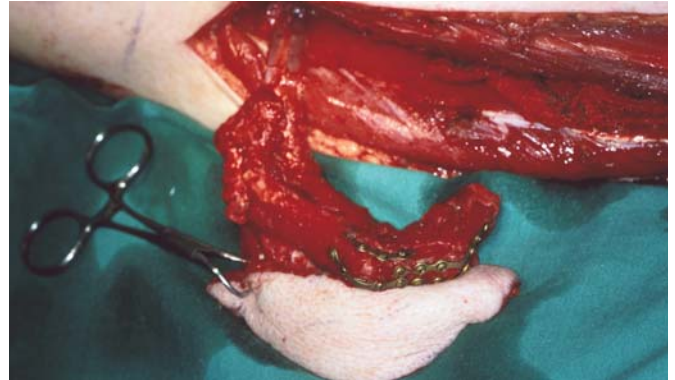


FIGURE 2: Free flap prepared for transfer to mandible. Note blood vessel still attached. (Image courtesy of Mr Gerard Smith.)



FIGURE 3: Free flap placed at recipient site with fixation plates. (Image courtesy of Mr Gerard Smith.)



FIGURE 4: Skin marked out for radial forearm free flap procedure. (Image courtesy of Mr Gerard Smith.)

Fibula free flap

The fibula free flap is regarded as the mainstay in mandibular reconstruction.^{19,20,23,31} Long vascularised cortical bone is provided from the fibula and can restore angle to angle mandibular defects. The fibula allows placement of osseointegrated dental implants.¹⁹ Disadvantages include donor site morbidity and numbness of the foot and toe (Figures 1, 2 and 3).³²

Radial forearm flap

The radial forearm flap is used mainly to restore lateral edentulous defects (Figures 4, 5 and 6). The main disadvantages of this flap are inadequacy of available bone and donor site morbidity such as limited motion, grip strength and supination.^{4,32} Limited bone stock reduces the quality of osseointegration.¹⁹ Frodel *et al* showed that the radial flap had the largest number of specimens with inadequate bone volume for implant placement.¹³ The risk of radial fracture is estimated to be 17%²³ and this flap is now regarded as less popular for mandibular reconstruction. However, it is useful when restoring the anterior maxilla and non-tooth bearing areas of the mandible,²⁴ and when soft tissues need to be reconstructed.

Scapular free flap

A scapular free flap is an osteocutaneous flap and is a recommended choice for complex defects involving skin, bone and mucosa.²⁵ This flap, in general, accepts osseointegrated dental implants well,¹⁹ and a study of 55 patients over 12 years showed a success rate of 89%.²⁶

Iliac crest free flap

The iliac crest free flap offers the best bone stock for dental implants (Figures 7 and 8).¹⁹ The natural contours of the bone are helpful for reconstructing lateral and hemimandible defects, and studies show no significant differences in terms of orthopaedic or quality of life outcomes.²⁷ The success rate in a recent review averaged 96%.²⁹

Rehabilitation

Maxillofacial rehabilitation is the second important step in the management of patients with orofacial defects, as it restores the function of the region. Several important modern methods are discussed below.

Prosthodontics

Prosthodontic treatments depend on the degree of edentulousness or the type of defect present (Figures 9, 10 and 11). Fixed prostheses

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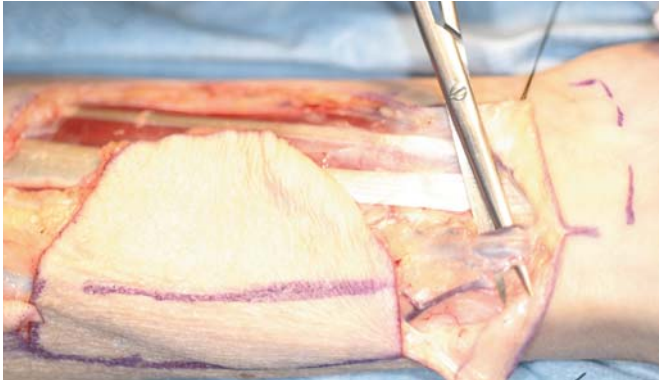


FIGURE 5: Preparation of free flap. Note dissection of vessel. (Image courtesy of Mr Dermot Pierse.)

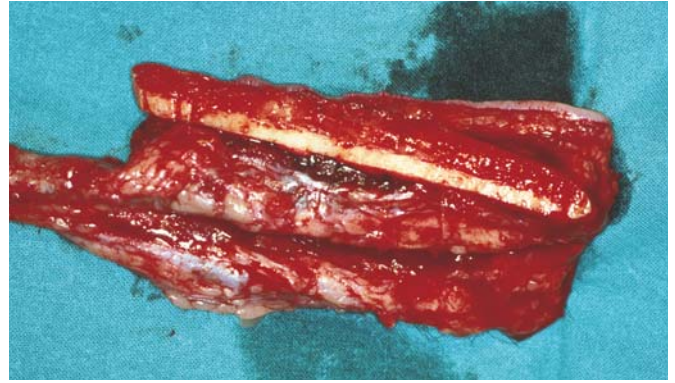


FIGURE 6: Radial free flap prepared for recipient site. (Image courtesy of Mr Gerard Smith.)

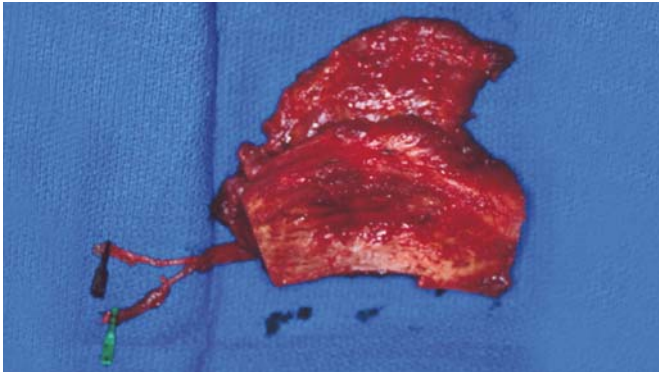


FIGURE 7: Iliac crest free flap prepared for recipient site. (Image courtesy of Mr Gerard Smith.)

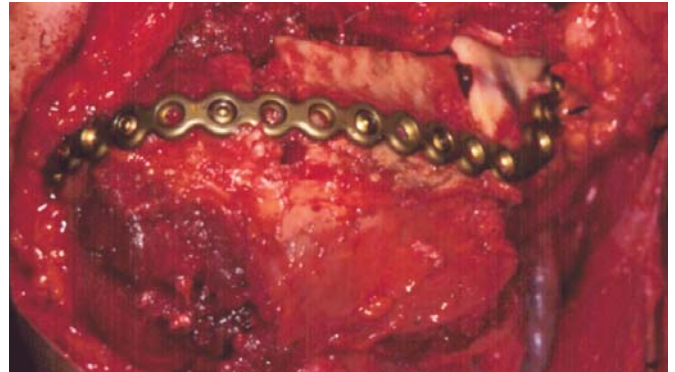


FIGURE 8: Iliac crest free flap at recipient site, with internal fixation. (Image courtesy of Mr Gerard Smith.)

avoid pressure on the mucosa, which may be tender, dry and friable in irradiated patients.³² Reports have shown that bone loss in the edentulous maxilla is greater when fixed prostheses are used in place of overdentures.³³ A study by Watson *et al* showed that overdentures involved more postoperative treatment than fixed prostheses for adjustments and mechanical problems. A recent consensus report stated that the implant-supported overdenture is the gold standard in restoring the edentulous mandible.³⁴ In patients with dry mouth secondary to radiotherapy for oral SCC, serious concerns regarding ability to maintain oral hygiene must influence treatment options. Teeth with a poor prognosis should be extracted before radiotherapy to avoid osteoradionecrosis.³⁰

Dental implants

Osseointegration, which is the basis of dental implants, has revolutionised the restoration of the oral cavity. The technique involves the direct attachment of osseous tissue to an inert, alloplastic material without intervening connective tissue. It has allowed increased denture retention and fixed placement of restorations in otherwise edentulous spaces, but studies have shown that up to a 6-7mm height of bone is required in order to carry out this technique.¹⁶ A study looking at the

success rate of implants into 6mm of bone height showed that 10.7% failed,¹⁴ while the overall mean survival rate in 14 trials with follow-up periods of two to 16 years involving 10,000 implants was found to be 94.4%, with a success rate of 86.8% for grafted bone.¹⁵

Implants placed in reconstructed bone perform identically to those placed in native bone, and the quality of bone was found to be the greatest determinant of fixture loss.³⁵ Patient satisfaction with this technique is high. In a study carried out on 28 patients, 85% reported satisfaction with the implants in reconstructed jaws and had no social problems.¹⁷

The use of implants in irradiated bone has been controversial. There is a risk of developing osteoradionecrosis of the mandible when carrying out surgical procedures such as implant placement. In patients about to receive radiation post-operatively, implants should not be loaded for six months.⁷ The overall success rate for endosteal dental implants was 92%. The implant success rate was 86% when the bone in which the fixtures were placed was irradiated post-operatively. In the 14 fixtures that were placed into previously irradiated bone, the success rate was 64%.⁷ The greater success of native bone and vascularised bone flap osseointegration compared to free bone grafts has been noted.³¹ Several factors need to be considered in placing implants in patients

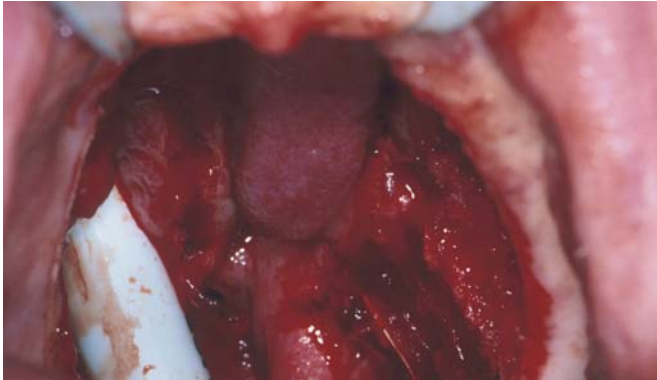


FIGURE 9: Palatal defect following excision of mucoepidermoid carcinoma. (Image courtesy of Mr Gerard Smith.)

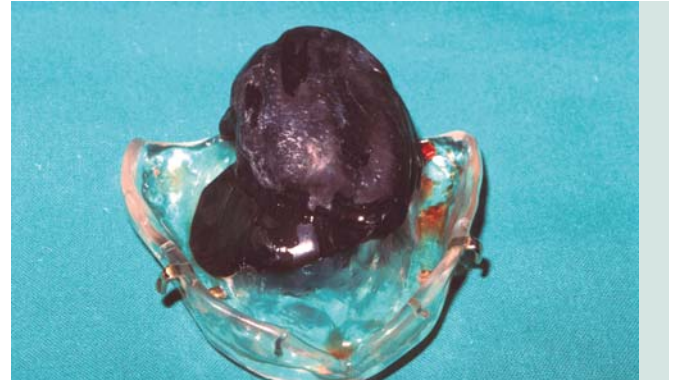


FIGURE 10: Obturator with gutta percha. (Image courtesy of Mr Gerard Smith.)

treated with radiation therapy for oral malignancies. The use of hyperbaric oxygen therapy has been shown to prevent osteoradionecrosis in patients undergoing post-radiation mandibular surgical procedures.³⁰ The risk of osteoradionecrosis is dependent upon the dose of radiation. Zygomatic implants are a useful treatment modality, where insufficient bone exists for maxillary implant placement. These factors are discussed in detail below.

Hyperbaric oxygen therapy (HBO)

The vascular vessels in the field of irradiation are narrowed, causing a decreased blood flow to the region. Irradiated host bone had been regarded as a contraindication to implant placement.²⁸ HBO is used by some as a precaution before implant placement in irradiated bone to reduce the likelihood of osteoradionecrosis.³⁶ However, studies have shown acceptable results in irradiated bone without HBO.³⁷

Radiation dose

There has been some discussion in the literature as to the importance of radiation dose on implant survival, suggesting that an upper limit of 55Gy30 should not be breached without the use of HBO. Disagreement as to when implants should be placed in irradiated bone still remains.³¹

Zygomatic implants

Introduced by Branemark in 1998, this long implant is used to restore the atrophic posterior maxilla in maxillectomy patients and has a success rate of between 82 and 97% in oncology patients.^{8,38} Zygomatic implants may be an alternative procedure to bone augmentation and sinus lifts,⁸ but failure is more problematic than with dental implants.

Future advances in rehabilitation

Several advances that may in time have significant applications in the field of orofacial reconstruction are currently under investigation and are discussed below.

Scaffold materials

In maxillofacial rehabilitation procedures, scaffold materials such as

proceramics and polymers are becoming more commonplace to help rebuild bone. Ceramics, such as hydroxyapatite and β -tricalcium phosphate, are strong enough to provide mechanical strength when replacing load-bearing skeletal structures.¹² Polymers, such as polyglycolic and polylactic acid, are also used but lack mechanical strength and may cause uncontrolled shrinkage of bone.¹¹ Current available scaffold materials have a number of drawbacks, such as insufficient penetration of cells and bone throughout the scaffold, inadequate degradation properties, or inadequate mechanical stiffness.¹¹

Growth factors

Bone morphogenic proteins (BMPs) are growth factors and cytokines known for their ability to induce the formation of bone and cartilage.³⁹ Basic fibroblast growth factor is considered to enhance angiogenesis and to support bone formation in the presence of vital bone cells.¹⁰ There is unreliable evidence supporting the efficacy of agents such as platelet-rich plasma in conjunction with dental implant therapy³ or wound healing.⁹ However, the use of BMPs has been hampered by the lack of suitable carrier agents for the BMP.

Distraction osteogenesis

Distraction osteogenesis (DO) has been used in correcting craniofacial deformities of the mandible, allowing gradual deposition of bone where two segments of bone are moved apart from one another. In a study on the reconstructed mandible, an average gain of 11mm of bone length was achieved using DO.⁴⁰ The procedure works well in oncology patients who experience poor functional outcomes after surgery due to scar formation or inadequate bone length, but comes with a higher risk of failure and complications. There is insufficient evidence as to whether DO is the best method available for vertical bone regeneration.³

Alloplastic materials

Alloplastic materials have been used successfully in the treatment of defects in conjunction with VFTT reconstruction.³⁹ Titanium hollow screw osseointegrating reconstruction plates (THORP), which are rigid locking plates with osteosynthetic capacity, are used, and they have a

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FIGURE 11: Obturator in situ restoring palatal defect. (Image courtesy of Mr Gerard Smith.)



FIGURE 12: Internal fixation plate used to place iliac crest free flap. (Image courtesy of Mr Gerard Smith.)

recorded hardware-related reconstructive failure incidence of only 7% when used with VFTT free flaps.⁶ Locking miniplates and double-threaded screws are the latest innovation, which allow locking to both bone and plates to increase stability.

Rigid fixation

The development of osteosynthesis plate technology has allowed biocompatible materials to internally fix fractures and unionise bone grafts with great success (Figure 12). Recently, biodegradable, self-reinforcing polylactide and polyglycolic plates/screws have been used for internal fixation of mandibular fractures with excellent success.^{2,9} This technique allows accurate correction of fractures but the main drawback is the invasive nature of this system.

Discussion

Reconstructive maxillofacial surgery can now draw upon many techniques in the reconstruction and rehabilitation of the orofacial region and reliable osseous reconstruction. Many institutions boast successful bony union rates of 95%.^{4,41} In reconstruction, the choice of flap depends on the tissue type being replaced and the choice of donor site. It seems that non-vascularised tissue transfer is no longer the accepted first-line treatment in orofacial defects, and it is now superseded by vascularised tissue transfer. In the past, non-distant pedicles were used to restore maxillofacial defects, giving way in recent years to free flaps. Initial research has reported high levels of success with free flaps, but data from randomised or comparative trials are needed to support this research.²³ Because of advances, patient quality of life has improved significantly in post-SCC reconstruction; however, the survival rate has not improved.

From the review of the literature it seems that osseointegrated implants offer the best functional and aesthetic outcomes, achieving success rates up to 94%. However, some papers expressed caution about their use in irradiated patients.^{36,37} They are employed not only to restore the dentition, but also to restore other structures such as the eye.

Advances in grafting and biomaterials have led to much success, not only in maxillofacial surgery but also in periodontics and restorative dentistry. Sinus augmentation procedures allow implants to be placed in areas of

bony atrophy. Bone substitutes may prove to be as effective as autogenous grafts for augmenting extremely atrophic maxillary sinuses. Upon healing, sites treated with xenografts and barrier membranes show a higher position of the gingival margin compared to sites treated with barrier membrane alone.³ DO and the use of growth factors such as BMPs have shown promise, but further research needs to be undertaken before these modalities can be recommended. Much research is being carried out in the field of muscular and neural tissue regeneration, and this may play a role in orofacial reconstruction in the future.

Conclusion

Orofacial defects can have detrimental functional and psychological effects on the patient. However, in the modern maxillofacial world, the surgeon has a wealth of techniques to draw upon to manage such defects. The management involves surgical reconstruction, prosthetic reconstruction or a combination of both. Microsurgery, osseointegration and bone technology have become the keystones in orofacial reconstruction, and major advances in recent years have resulted in more treatment modalities and increased success. The future is bright, as a wide range of techniques is being developed to improve upon the advances of the past few decades.

Acknowledgments

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ABSTRACTS

Predictable management of cracked teeth with reversible pulpitis

Abbott, P., Leow, N.

Background

The aims of this study were to assess symptoms and signs caused by cracks in teeth and to assess a conservative management protocol.

Methods

The symptoms and signs of 100 consecutive teeth that had reversible pulpitis associated with cracks were compared to findings from other reports. Teeth were managed with a conservative protocol, which involved removal of cracks, caries and restorations, followed by placement of a sedative lining and interim restoration, unless there were pulp exposures or insufficient tooth structure remaining. Teeth were monitored for pulp healing after three months and for up to five years.

Results

Eighty teeth did not require endodontic treatment. One tooth had an uncertain pulp status at review appointments. Fifteen teeth required endodontic treatment at the initial appointment because of carious pulp exposures (four teeth), cracks extending into the pulp (two), and posts required (nine). Four other teeth required endodontic treatment later following conservative pulp treatment because of continued pulpitis under the temporary restoration (one), pulpitis after core restoration (two), and pulp necrosis diagnosed at the review (one).

Conclusions

Provided that there is an accurate diagnosis of the pulp status and its cause, teeth with reversible pulpitis due to cracks can be treated conservatively without endodontic treatment in about 80% of cases.

Australian Dental Journal 2010; 54 (4): 306-315.

The longevity of different restorations in primary teeth

Qvist, V., Poulsen, A., Teglers, P.T., Mjor, I.A.

Background and aim

This paper reviews three published papers and adds results from a fourth study, which aimed to determine which restorative material would be the best alternative(s) to amalgam (AM) in primary teeth.

Design

All studies had a practice-based design and were part of the routine treatment of children and adolescents. The clinicians were assigned which materials to use in a randomised manner in the first three studies, which lasted for seven to eight years. In the fourth study, conducted four years after the initial studies, the clinicians were free to select the restorative materials.

Results and conclusions

Resin modified glass ionomer (RMGI) and compomer (COM) restorations showed similar longevity compared with AM, whereas conventional GI restorations showed significantly shorter longevity. The studies indicated that the 'new and improved' materials based on *in vitro* tests did not always show enhanced clinical properties. In the last study, where clinicians freely selected the restorative materials they used in their practices, seven used COM, one used conventional GI materials and one used a combination of the two types of material.

International Journal of Paediatric Dentistry 2009; 20 (1): 1-7.

Contradictions in the treatment of traumatic dental injuries and ways to proceed in dental trauma research

Andreasen, J.O., Lauridsen, E., Andreasen, F.M.

Almost all treatment procedures used for dental traumas are still today not evidence-based, a fact that makes it difficult to analyse the long-term outcome of healing and its relationship to treatment. Crown fractures with extensive dentine exposure represent a dominant injury in the permanent dentition. Accepted treatment philosophy is dentine coverage (dental liner and/or dentine-bonded restoration) to prevent bacteria penetration into the pulp. Today, apart from deep proximal fractures, there is no evidence that this treatment is necessary to protect the pulp. In the case of luxation injuries, the accepted treatment principles appear to be anatomically correct repositioning, stabilisation with a splint and, sometimes, antibiotic coverage. In clinical studies, these principles could not be proven to optimise either periodontal or pulpal healing, the explanation possibly being that both reposition and application of splints in certain cases add extra damage to the pulp and periodontal ligament. In the case of root fractures, with dislocation, fast and optimal repositioning and rigid long-term splinting (i.e., three months) have been considered the principle of treatment. However, a recent clinical study has shown that short-term splinting with a semi-rigid splint appears to optimise fracture healing. In tooth avulsion with subsequent replantation, cleansing of the root surface for contamination and systemic antibiotics has been considered essential for pulp and periodontal healing. These treatment concepts have been derived from experimental studies in animals. However, their importance could not be verified in large clinical studies. Ideally, randomised clinical studies are needed in the future for selected trauma types. The influences of repositioning and splinting, and the role of infection and antibiotics, should be further investigated. However, for ethical reasons, it will be difficult to perform randomised studies on trauma victims and we will be forced in the future to rely on experimental animal studies supported by clinical observational studies.

Dental Traumatology 2010; 26: 16-22.

Platform switching and marginal bone-level alterations: the results of a randomised controlled trial

Canullo, L., Fedele, G.R., Iannello, G., Jepsen, S.

Objectives

This randomised controlled trial aimed to evaluate marginal bone level alterations at implants restored according to the platform-switching concept, using different implant/abutment mismatching.

Material and methods

Eighty implants were divided according to the platform diameter in four groups: 3.8mm (control), 4.3mm (test group₁), 4.8mm (test group₂) and 5.5mm (test group₃), and randomly placed in the posterior maxilla of 31 patients. After three months, implants were connected to a 3.8mm-diameter abutment and final restorations were performed. Radiographic bone height was measured by two independent examiners at the time of implant placement (baseline), and after nine, 15, 21 and 33 months.

Results

After 21 months, all 80 implants were clinically osseointegrated in the 31 patients treated. A total of 69 implants were available for analysis, as 11 had to be excluded from the study due to early unintentional cover screw exposure. Radiographic evaluation showed a mean bone loss of 0.99mm (SD = 0.42mm) for test group₁, 0.82mm (SD = 0.36mm) for test group₂ and 0.56mm (SD = 0.31mm) for test group₃. These values were statistically significantly lower ($P < 0.005$) compared with control (1.49mm, SD = 0.54mm). After 33 months, five patients were lost to follow-up. Evaluation of the remaining 60 implants showed no difference compared with 21-month data except for test group₂ (0.87mm) and test group₃ (0.64mm). There was an inverse correlation between the extent of mismatching and the amount of bone loss.

Conclusions

This study suggested that marginal bone level alterations could be related to the extent of implant/abutment mismatching. Marginal bone levels were better maintained at implants restored according to the platform-switching concept.

Clinical Oral Implants Research 2010; 21: 115-121.

Quiz answers (from page 11)

The diagnosis is *peri implantitis*, i.e., a 'periodontitis'-type lesion around an implant. The possible causes of this condition include:

- (i) incorrect placement of implant;
- (ii) bacterial contamination of implant surface;
- (iii) bacterial contamination of abutment/implant interface; and,
- (iv) excess cement with cemented restorations.

Patients who have or had a history of periodontal disease are particularly at risk of this condition. The roughened implant surface itself may be a risk factor.

Treatment

Conservative subgingival debridement does not usually effect a great change in this condition. Most authors agree that the most effective way to treat this is by surgical means, i.e., open flap debridement to remove the granulomatous tissue. Chemical decontamination of the implant surface with citric acid can also be useful. The reported incidence in the literature is 28-56%. Meticulous oral hygiene is of paramount importance in preventing this condition.



FIGURE 3:
Pre-debridement



FIGURE 4:
Post-debridement



FIGURE 5:
Post-op.

FACT FILE

Guidelines for treating patients taking bisphosphonates prior to dental extractions

DR S ROGERS, DR N RAHMAN, MR D RYAN, PROF S FLINT, DR C HEALY, and PROF. LFA STASSEN give an overview of treatment for the patient who is taking bisphosphonates.

Oral bisphosphonates

Oral bisphosphonates are used in the treatment of osteoporosis, among other conditions, and have proved valuable in the prevention of osteoporotic fractures. Patients taking oral bisphosphonates carry a small risk of developing osteonecrosis (OCN) of the jaws following dental surgery. This risk is especially small if the drug has been taken for less than three years and without corticosteroid use. A drug holiday has been advocated in the case of prolonged oral bisphosphonate use, but there is no proof of a significant benefit.

Intravenous bisphosphonates

Intravenous bisphosphonates are administered to control hypercalcaemia of malignancy, bone metastases and lytic lesions (breast/prostate/lung cancer, multiple myeloma). These drugs do not improve the overall prognosis but are incredibly valuable in increasing the patient's quality of life, and should not be discontinued by the dentist for any reason. Stopping IV bisphosphonates short term does not reduce the risk of developing OCN.

Patients should undergo a comprehensive oral examination before the commencement of IV bisphosphonates, as with patients due to receive oral radiotherapy. All questionable teeth should be removed, restorations completed and the patient educated in proper oral care (hygiene and diet advice) and followed up.

Treatment of a patient already receiving IV bisphosphonates is not ideal. Patients must be warned of the high risk of developing OCN. Implant placement is not advised in patients receiving IV bisphosphonates. Extraction should be avoided and endodontic treatment and maintenance of the tooth/root considered (even if it is not fully restorable). However, extraction may be unavoidable due to associated periapical/periodontal infection.

Extractions

The following principles apply to extractions in those on oral and IV bisphosphonates:

Optimum pre-operative oral hygiene:

- patients should be given oral hygiene instructions, use chlorhexidine mouthwash daily for one week pre op, and see the hygienist if necessary before any surgery is performed.

A loading dose of amoxicillin 3g orally should be administered pre-operatively (if the patient is not allergic); 600mg clindamycin should be used if the patient is allergic to penicillin.

Avoid anything that may reduce vascularity:

- local anaesthetic agents must be used plain (without



Bisphosphonate-related osteonecrosis.

vasoconstrictors such as adrenaline), e.g., mepivacaine hydrochloride 3% (Scandonest);

- atraumatic surgery must be performed to reduce crushing of bone and further delay in healing; and,
- sutures may be placed, but not so tightly that they cause further ischaemia.

Post-operatively:

- soft diet;
- twice daily rinses with chlorhexidine and saline until healed;
- amoxicillin 500mg tds for one week (if there is no allergy); and,
- a blow-down splint may be used to protect the socket but is not necessary in all cases.

The patient should be followed up to ensure closure of the socket. If OCN develops, the patient should be referred to an oral and maxillofacial surgery (OMFS) clinic.

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Difficult patients

The Journal of the Irish Dental Association has invited Dental Protection to provide a series of articles on risk management. Dental Protection describes itself as the leading provider of indemnity for the dental profession. The series will run for two years and starts with this article by JANE MERIVALE on how to handle the 'difficult' patient.

Most clinicians would describe an 'ideal' patient as someone we get on with, someone we like, who likes and trusts us, who co-operates with treatment, is compliant, punctual, chats and is friendly, but doesn't talk too much (causing us to over run) and is willing to tolerate dental procedures. They will generally accept mild discomfort without complaining and accept the limitations of what can be done, while remaining realistic and understanding. Basically, they help to make the whole process of providing dental treatment run smoothly. The ancient Greeks had a word for this type of behaviour and developed a philosophy, stoicism, which asserts that happiness can only be achieved by accepting life's ups and downs unemotionally, with endurance and patience. Indeed, if all our patients were stoics, an article like this would not be needed and the provision of dental care would certainly be much easier.

While we all have large numbers of patients that we enjoy treating, there will also be a few others whose very name engenders a sinking feeling when we look at the appointment book. In anticipation, our stress levels rise and often, like a self-fulfilling prophecy, the appointment goes from bad to worse, simply because this patient has affected us to the extent that our behaviour changes. We feel undermined, inadequate, defensive and angry, or out of control, and the appointment is predictably an ordeal, so the next encounter is dreaded by the clinician and no doubt the patient too. This cycle needs to be recognised if we are to manage 'difficult' patients and reduce our risk when dealing with them.

Types of difficult patients

Broadly speaking, patients are difficult either because of their behaviour or because of the dental problems with which they present. Among the range of difficult behaviours are: the 'worried well' (who seem to make mountains out of molehills); those who ignore or deny

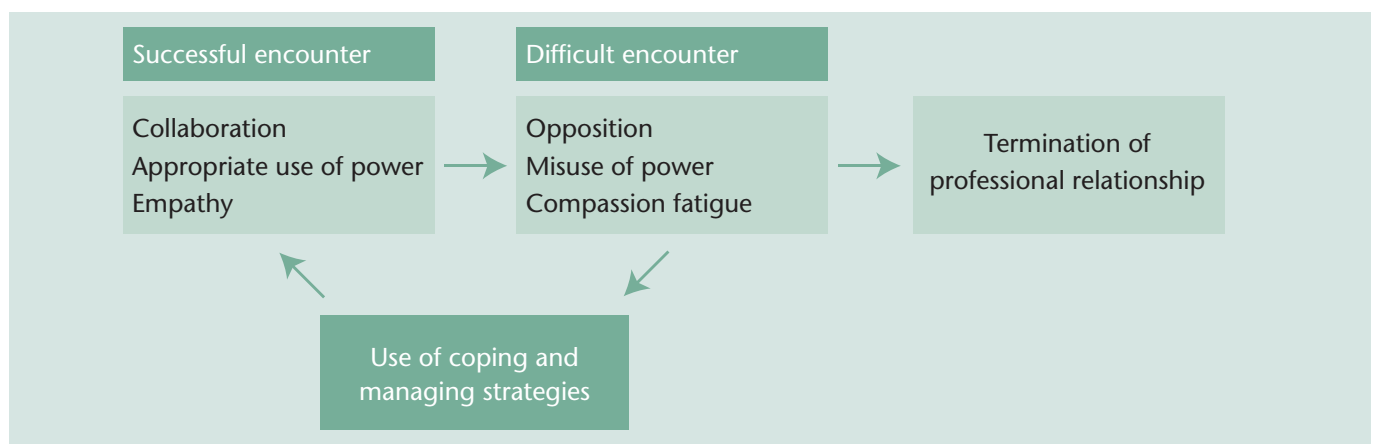
problems; the non-compliant; the overly dependent; those who pay us 'social' visits (perhaps because they are lonely); and, those who abdicate responsibility for their problems and try to involve us in the solution! Some patients are manipulative, whining or excessively complimentary and over familiar; others talk very slowly and ramble, unfocused. Some have hidden agendas and others are aggressive, selfish and demanding.

Patients with difficult dental problems may present with multiple, complex complaints. Some have chronic pain, possibly not of dental origin, making the diagnosis difficult, and some will have underlying psychiatric disorders such as bipolar disorder, early onset dementia or depression.

Research shows that nearly all clinicians have patients that engender a sense of frustration or dislike, but rather than just describing these all too familiar patients, Nancy Elder¹ has also proposed the following model of care to help us to manage them (see panel).

Not all patients are stoics and Elder identifies the hallmarks of a successful professional relationship as being one in which there is joint decision making (collaboration), where the clinician expresses empathy and there is an appropriate use of power. Perhaps we have not considered power in this equation before, but both patients and clinicians exert power, and traditionally the clinician was the more powerful member. But patients exert power by the information they choose to share, as well as by their decisions to adhere to treatment plans. As dentists we wield power, sometimes inappropriately, by offering some, but not all, diagnostic options, as well as controlling the flow of conversation with questions.

Perhaps now we can see where things may go wrong. So called 'difficult' patient encounters may be ones when we constantly meet with opposition, when there is an inappropriate use of power, and when we simply run out of empathy and experience compassion fatigue.



PRACTICE MANAGEMENT

As dentists, we consistently need to provide high quality, patient-centred care. We need to achieve good clinical outcomes, mindful that we also run a business, and the flow of patients through a working day needs to be carefully planned and maintained. The practice needs to be financially viable and supportive of both our staff and our own physical and mental well-being, and a difficult patient, like a belligerent adolescent, can put a spanner in the works of even a well run practice, causing stress and disruption.

Therefore, what strategies can we adopt?

Collaboration vs. opposition

To achieve collaboration with difficult patients we need to try and prioritise their concerns by taking a thorough history, performing a detailed examination using appropriate tests, and then fully explaining the findings and diagnosis with the aim of facilitating the patient's decision making. Short-term relief will be necessary at times but we need to implement longer-term treatment plans in small, achievable steps.

If we are repeatedly met with opposition in this process, just how long we persist is a matter of judgement. It may also help to discuss the difficulties with an experienced colleague or advisor.

Appropriate use of power vs. misuse of power

We need to set explicit 'clinical rules', which are in effect boundaries to define the acceptable limits of behaviour. An example would be to have clear rules in regard to appointment keeping, lateness and over running.

The number of concerns addressed per visit should be limited and the time allowed for each appointment strictly adhered to. These patients are likely to have been difficult with previous practitioners and have possibly been declined treatment elsewhere. Perversely then, it often helps to schedule these patients more frequently so that they know they will be returning, and thereby learn that there will be another appointment ahead that you will honour.

But some of these patients may continue to misuse their power – for example by refusing to listen or take advice, by always turning up late or not seeing a course of treatment through and then turning up, unscheduled and in pain – and we may decide that enough is enough.

Empathy vs. compassion fatigue

Empathy is an experiential way of engaging with another person's emotional state. Used effectively, empathy can enhance patient–dentist communication and trust, and the effectiveness of treatment. With difficult patients we need to be empathetic while at the same time maintaining a professional demeanour.

But we are also human and despite our best intentions we all suffer compassion fatigue at times, especially when we are tired, and difficult patients are particularly draining and tend to leave us exhausted. So we need to be careful not to schedule too many difficult patients together and to take regular breaks away from work to replenish our ability to care.

Endings

Our strategies may transform some difficult encounters into workable relationships, particularly if we consider the 'difficult' individual as simply being 'different'. But there will be a few instances where we do not succeed and either the clinician or the patient terminates treatment. Patients may choose to go elsewhere if we have 'refused' to meet their demands, and in other circumstances we may decline to treat the patient any more and respectfully suggest that their best interests might be better served elsewhere. However, do not turn a patient away simply because they are difficult. Try the above strategies first and try to make it work because, as one difficult patient leaves, another has a habit of appearing, and we need to develop our skills in this area.

Jane Merivale LL.M BDS Jane is a dento-legal advisor who regularly handles cases for dentists working in Ireland. As well as working in general practice for 26 years, Jane has also studied for a law degree and began working full-time for Dental Protection in 2008.

Reference

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Every day, dentists face a myriad of clinical problems. Scheduling issues, time management, problems with lab work, emergencies, non-compliant patients and unreasonable patient expectations all contribute to boosting your stress level. However, all of these issues may seem microscopic when put up against what I think are the four biggest overarching problems in clinical dentistry.

Don't try to save everything

The first biggest problem I see in clinical dentistry is 'herodontics'. This applies to dentists who try to save everything that comes their way. If I had a dollar for every lesson I learned the hard way I could spend a month in Europe! Should you retreat a bombed out molar root canal or should you extract it and do an implant and crown, or a three-unit bridge, or add a tooth to their partial? Should you really be doing a root canal, build up and crown on an anterior incisor without a 3mm ferrule or extract? The worst part about herodontics is when those patients show up in your office 12 months later with the tooth in their hand and say: "I just spent \$2,000 on this tooth and it only lasted a year". Then your guilt tells you to credit the \$2,000 to the implant and crown, or a three-unit bridge.

Now you are working at a huge loss, the patient is unhappy, you look incompetent, the patient questions your work and your day has just been ruined. You might even have lost that patient forever. How messed up is that? It's not your fault that your patients don't brush properly, don't floss at all, eat sugary sticky foods, drink fizzy drinks and don't get regular checkups, but it is your fault if your treatment doesn't last at least five years. If you don't believe me ask your local state board of dental examiners, or go ask a dental malpractice lawyer. You have to treatment plan aggressively enough so that the treatment is going to last at least five years. Period.

Consult with your local specialists

I think the second biggest problem in clinical dentistry is not knowing what you don't know. Like they say: "There are known knowns, there are things we know that we know and there are known unknowns". That is to say, there are things that we know we don't know! You obviously know what you know – coursework during dental school, continuing education courses, performing a lot of clinical dentistry and seeing over

Face the four big problems

DR HOWARD FARRAN, founder of Dentaltown.com, advises on dealing with what he sees as the four biggest challenges facing dentists.

time what works and what does not. But there are also unknown unknowns. There are things we don't know that we don't know. Have you ever done a bone graft after an extraction? Have you ever taken on an orthodontic case or perio surgery? Have you ever done a sinus lift or placed a single root form implant? If you've answered NO to all these questions you need to form a very tight team with your local specialists. The best way to learn more of your unknown unknowns is working with your team of specialists. When was the last time you took a case over to your specialist at lunch or after work to review the pano, FMX, study models, photographs and perio charting? I am absolutely positive that you will learn a lot by doing this. Specialists love to work closely with their referring dentists. Through working together, you might find something as simple as an interproximal lesion that you missed on the bitewings. Sometimes it is something as simple as extracting a tooth on an anxious patient. Other times they blow you away when they complete what you swore to be an impossible implant case due to sinus anatomy or lack of bone. One time I went over a crown lengthening procedure with a periodontist only to learn that the tooth needed to be extracted and replaced with an implant and crown. To help you learn more of what you don't know, Dentaltown.com has more than 90 free online continuing education courses teaching endo, perio, pedo, prosthodontics, ortho, oral surgery, implants, infection control, practice management, etc. These courses are free and have received outstanding reviews as they have been developed by some of the best speakers in dentistry. More than 200,000 courses have been taken so far. The feedback is so positive, you must check them out.

Get up to speed on technology

I think the third biggest problem in clinical dentistry is not being up to date on the best technology available to help the outcomes of your cases. How much better can you perform high-quality long-lasting dentistry if you use technologies that allow you to clean out endo canals with 300rpm NiTi's? How much better and high quality is your working length in a root canal if you use instant digital radiography with apex locators?

What dental procedures are you doing that, if you had referred them to a specialist, better technology would have been used? Most periodontists and oral surgeons who place implants have much better radiographs

PRACTICE MANAGEMENT

using cone beam computed tomography (CBCT); do you? Just imagine the boost in case acceptances you'd see if you could produce clear-as-day images for your patients through the use of CBCTs and intra-oral cameras that do more than simply explain what needs to be done!

Get the best long-term trained staff

I think the fourth biggest problem in clinical dentistry is not having the best long-term highly trained staff available. This drastically affects your clinical dentistry, from keeping your surgical site clean and visible to using all your dental sundries and products in the right manner. How many crowns come off because the cement wasn't mixed correctly? This is why I like the 3M ESPE Rely-X automix dispenser because it dispenses the correct amount of both the catalyst and the base, making it almost foolproof. Having a winning team that is highly trained will then make almost any procedure you do foolproof. Do you take your staff to dental continuing education courses? I have always been amazed at how many dentists show up alone to continuing education courses.

When I was earning my MAGD and my DICOI, I would say the average was only one in three dentists who brought their staff with them; this is a huge mistake. My assistant, Jan, has been at my side for more than 20 years and has gone to many continuing education courses with me. I am

sure Jan knows as much as I do! I can't even count how many times she has helped me out in a bind whether it be changing the correct instruments quickly when removing a boney, impacted third molar to keeping an implant socket thoroughly flushed so as not to burn bone. Make your dental assistant team top notch and your dentistry will improve greatly.

You can overcome these problems

If you're facing any or all of these problems, you need to know how negatively they can impact your practice. You can overcome these problems if you know your limitations, increase your knowledge base, get more involved with your specialists, utilise the best technology that fits your practice and create the best staff possible.

Above all, remember why you became a dentist in the first place! I know, I know, "Easier said than done, Howard," but you'd be surprised at how taking care of the big problems can drastically lessen all of the smaller problems you face each day.

Dr Howard Farran is an international speaker who has written dozens of published articles. He will be addressing the IDA Annual Conference in Galway in May.

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DIARY OF EVENTS

FEBRUARY 2010**IDA Board Meeting**

February 5 IDA House

Council of the Irish Dental Association – Meeting

February 6 IDA House

**Irish Society of Periodontology –
Annual Periodontal Symposium 2010**

February 12 Royal College of Physicians of Ireland

For further information and to reserve your place please contact Dr John Molloy, Secretary, ISP, Tel: 091-569110, or Email: perio@ireland.com.

South Eastern Branch – Annual Scientific Conference

February 19 Faithlegg House Hotel, Waterford

Speakers to be confirmed.

Metropolitan Branch – Retired Dentists Social Evening

February 25 Hilton Hotel, Dublin, 6.00pm

All dentists, whether retired or not, are very welcome to attend and have a chat with colleagues who have 'been there' and 'done that'.

Irish Endodontic Society Meeting

February 25 Dublin Dental Hospital, 7.30pm

Case presentation night.

Metropolitan Branch – Annual Scientific DayFebruary 26 Grosvenor Room, D4 Ballsbridge Court Hotel
(formerly Berkeley Court Hotel)

'The Compleat Dentist': work/life balance, science, research, clinical practice, practice management, finance, table discussions and trade show.

MARCH 2010**Metropolitan Branch – Scientific Meeting**March 11 Grosvenor Room, D4 Ballsbridge Court Hotel
(formerly Berkeley Court Hotel)

'Radiation in the dental surgery', presented by Mandy Lewis, Stephen Fennell, Dr Maurice Fitzgerald, and Dr Andrew Bolas.

Irish Endodontic Society –**Presentations by recent endodontic graduates**

March 25 Dublin Dental Hospital, 7.30pm

APRIL 2010**IDA Board Meeting**

April 16 IDA House

Council of the Irish Dental Association – Meeting

April 17 IDA House

MAY 2010**IDA Annual Conference – 'Pearls of Wisdom'**

May 12-15 Radisson Hotel, Galway

Irish Society of Dentistry for Children – Annual Conference

May Limerick

Further details to follow when available.

JULY 2010**The 2nd International Scientific Conference of Faculty of
Dentistry at Jordan University of Science and Technology**

July 7-10 Holiday Inn Hotel, Amman, Jordan

Abstract submission, registration, scientific and social programmes are available on the conference website – www.just.edu.jo/jidc. For more information, please Email: ziadd@just.edu.jo.

OCTOBER 2010**Public Dental Surgeons' Seminar**

October 6-8 Clarion Hotel, Sligo.

For further information, contact IDA House on 01 2950072.

NOVEMBER 2010**FTI 2010 – The 2nd Future Trends in Implantology International
Dental Conference**

November 11-13 Florence, Italy

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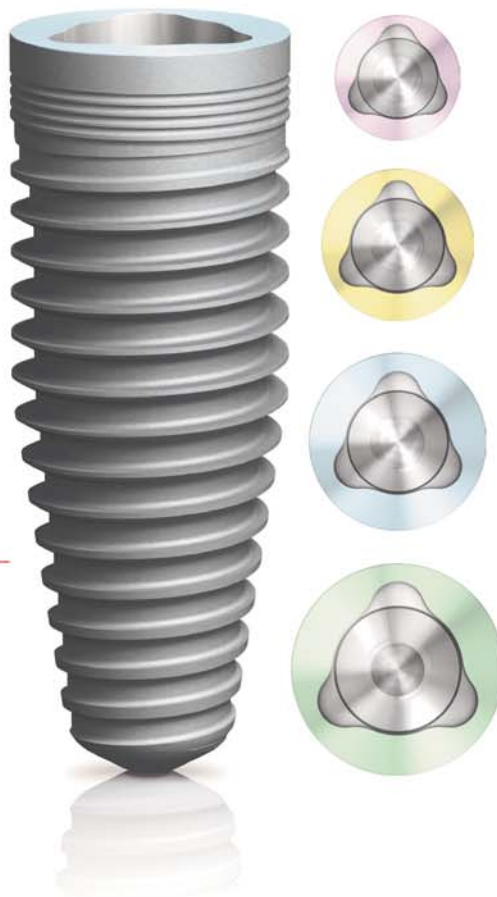
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