

REVIEWS & ABSTRACTS:

Abstracts include edited Australian Medlars, as well as other basic sciences', orthodontic, dental and surgical literature. All inquiries regarding information on specific articles should be directed to authors. Articles or books for review should be addressed to **Dr. S.G. Jacobs, Reviews and Abstracts Editor, Australian Orthodontic Journal, C/- Royal Dental Hospital of Melbourne, 711 Elizabeth Street, Melbourne, Victoria 3000.** Offers to write abstracts or reviews of articles or texts of interest to orthodontists are welcome.

LITERATURE ABSTRACTS

PERIODONTICS

Tegsjö, U., Valerius-Olsson, H. & Andersson, L.
(Periodontal conditions following surgical exposure of unerupted maxillary canines - a long term follow-up study of two surgical techniques)
Swed. Dent. J. (1984) 8: 257-263

The gingival health of surgically exposed canines of fifty Swedish school children was assessed over a follow-up period of 30-56 months.

Two methods of surgical exposure were compared. The first method involved the total removal of bone and buccal mucosa to expose the anatomical crown. The second procedure involved an apically repositioned flap and so the gingival tissue was retained.

The clinical examination paid particular attention to the presence of gingivitis, width of keratinised gingiva, sulcus depth and gingival recession.

The results were in some respects predictable. The radical procedure resulted in greatly reduced width of attached gingiva.

Gingivitis was present on the buccal surfaces of 29% of the radical exposure group compared with 7% of all buccal surfaces in the apically repositioned flap group. While there is a statistically significant difference in these figures, the difference could be fully accounted for by a lack of effective plaque removal caused by a faulty cleaning method.

Sulcus depths were very much lower in the radical exposure group when compared with the control and flap groups.

The amount of gingival recession was greater for the radical exposure group than the control group and apically replaced flap group.

The authors concluded that over the long term, when buccally placed canines must be exposed, the apically repositioned flap is the treatment of choice.

Rain Papli

RADIOLOGY

Eliasson, S., Julin, P., Philip, A. & Stenström, B.
(Absorbed doses at varying tube voltage in lateral cephalography)
Swed. Dent. J. (1985) 9: 117-127

Since radiographic cephalometry is usually performed on patients in the younger age groups, adherence to the 'As Low As Reasonably Achievable' (ALARA) rule is particularly indicated. One way to reduce the radiation dose is to increase the x-ray tube voltage (kv). An increase in tube voltage results in the generation of more photons with high penetrative power. Since these photons are less readily absorbed by matter, they will produce less biological damage to tissues. However, less photon absorption will also result in an image with less photographic contrast. The authors have measured the absorbed doses to various organs in the head and neck area of a Rando phantom under clinical conditions and with different tube voltages, ranging from 63 to 127kv. On the basis of the results of these measurements the lowest recommendable tube voltages for the various organs were determined as follows:

ORGAN LOWEST RECOMMENDABLE TUBE VOLTAGE (in kvp)

Skin	90-100
Thyroid Gland	70-75
Salivary Glands	90-100
Pituitary Gland	90-95
Bone Marrow	90
Eye Lens	80

The authors conclude that 'lateral cephalography should be performed using a tube voltage of approximately 100 kvp'. Although the adverse effect of this measure upon the image quality is discussed in general terms, no evaluation is given regarding the diagnostic yield of the resulting cephalogram. It is obvious that the highest possible tube voltage must be selected, consistent with diagnostic requirements. This recommendation, however, applies to any extra-oral radiographic procedure.

J. Keur

SURGERY

Zetz, M.R., Dean, C.D., Burris, A.G. & Griffith, A.R.
(Correction of skeletal Class II malocclusions with deep bite by rapid extrusion of posterior teeth)
Oral Surg. (1984) 58: 631-636

The combined surgical and orthodontic treatment of skeletal Class II malocclusions with deep bite (dental Class II/2) is most time consuming, due to the orthodontic correction of the vertical dimension. This can be achieved by either pre-surgical arch levelling or post-surgical posterior segment extrusion. The latter enables clockwise rotation of the mandible at the time of mandibular advancement which improves facial aesthetics.

Several surgical procedures have been advocated to solve the vertical discrepancy problem and to shorten treatment time but the technical difficulty and morbidity is then increased. The authors describe their experience of eleven patients with a technique of rapid extrusion of the buccal segments during intermaxillary fixation.

Pre-surgical orthodontics is limited to the alleviation of crowding, rotations and dental compensations with no attempt to resolve the vertical dysplasia. A mandibular advancement is performed to provide a Class I cuspid relationship with contact anteriorly and to create a vertical space between the arches posteriorly excepting the second molars. Following three and a half weeks of intermaxillary fixation, the surgical splint is removed and the posterior sections are cut free and discarded. After the splint is replaced and intermaxillary fixation resumed, vertical elastic traction to extrude the posterior segments into occlusion is commenced and can be maintained continuously.

This procedure is stable, generally painless with no periodontal or pulpal problems and treatment time is markedly reduced.

Andrew Heggie

Kraut, R.A.

(Surgically assisted rapid maxillary expansion by opening the midpalatal suture)
J.Oral Max.-fac. Surg. (1984) 42: 651-655

Surgical-orthodontic expansion of the maxilla in which selected maxillary osteotomies are used to facilitate rapid

maxillary expansion (R.M.E.) has been reported over the past decade. The importance of the circum-maxillary sutures as a factor in resisting midpalatal separation where R.M.E. is employed is now more generally recognized and is supported by several clinical and experimental studies.

The author describes a standard approach used on 25 patients, where R.M.E. was surgically assisted. The day prior to surgery a R.M.E. appliance was inserted. Under general anaesthesia, the maxilla was exposed and horizontal osteotomies were performed from the pyriform rim to the posterior wall of the maxillary sinus bilaterally. The pterygomaxillary sutures were also separated. In 17 cases, a fine osteotome was used to separate the midpalatal suture. The appliance was then activated until resistance was felt, and post-operatively, the patients were instructed to activate the appliance 0.5mm twice per day and R.M.E. was monitored every three days.

Two of the twenty-five patients failed to respond to R.M.E. and subsequent para-sagittal palatal osteotomies were later performed which enabled midpalatal opening. All other patients responded to R.M.E. to the amount required and later observations suggested the surgically assisted cases were more stable.

Andrew Heggie

MEDICINE

Delta Agent

Communicable Diseases Intelligence Bulletin 85/6 March 1985 page 2-3

The delta agent is an RNA virus which replicates in patients with acute and chronic hepatitis B virus infection. It has now acquired the status of 'Hepatitis D virus' (HDV) and its importance as a cause of rapidly progressing chronic liver disease has been established.

The delta agent is highly infectious to patients who are Hepatitis B antigen carriers and may thus spread rapidly through a family or community with a high prevalence of chronic Hepatitis B infection. Superinfection prevalence is as high as 65% in parts of Kenya.

Rapidly progressive liver disease has been reported in adult HBV carriers superinfected with delta virus. Progression from minimal liver disease to cirrhosis in a period of one year has been reported.

Delta virus can only replicate in the presence of acute or chronic HBV infection and because most delta superinfected carriers are of low HBV infectivity, these patients rarely transmit the infection to non-HBV infected individuals.

Ian Chambers

Hepatitis B - Health Risk for Dentists

Communicable Diseases Intelligence Bulletin 85/6 March 1985 page 3-4

Hepatitis B virus (HBV) infection is well known as a significant health risk to dental personnel, however reports of transmission of infection from dentists to patients are few.

A recent U.S.A. report has described nine cases of clinical HBV infection in a rural community. All cases except one had been treated by a local dentist. The dentist was tested and found to be HB surface antigen positive, although he had no known history of HB infection, nor knowledge of HB carriers in his practice. He had no other risk factors for HBV. He did not routinely wear gloves whilst treating patients, but denied lacerations or dermatitis of his hands.

The patients had the same viral subtype as the dentist, and none had histories of risk factors for HBV infection other than dental work which had produced bleeding. The spouse of one HBV patient was also surface antigen positive. He had other risk factors for HB.

A large seroprevalence study has been carried out on the dentist's patients to attempt to determine the degree of subclinical transmission, but the results have not

yet been released. The dentist voluntarily suspended practice and has not resumed.

Dentists should consider being tested for evidence of exposure to HBV and those not immune should consider vaccination.

Ian Chambers

Suboptimal Response to Hepatitis B Vaccine Given by Injection into the Buttock

Communicable Diseases Intelligence Bulletin 85/6 March 1985 page 4-8

Hepatitis B vaccine is highly immunogenic and effective. Large studies have shown antibody induction in over 90% of healthy adult recipients of the three-dose series.

Since vaccine licensure however, there have been reports of suboptimal responses, where only 68% and 82% of normal adults responded to vaccination. In these series, many of the vaccinations had been given by buttock (gluteal) injection, in contrast to the arm (deltoid) injection used in all earlier vaccine studies.

Further studies on this phenomenon have also suggested that the response to HB vaccine is higher when the vaccine is given in the arm than in the buttock. The most likely explanation is that injections given in the buttock frequently fail to reach muscle and are instead deposited in fat where the vaccine may not be well mobilized.

The current recommendation is that the arm be used as the site of HB vaccine administration in all adults.

Ian Chambers

BOOK REVIEWS

The design, construction and use of Removable Orthodontic Appliances

by Adams, C.P.

5th Edition. Published by J.Wright & Sons Ltd. (Bristol) 1984.

Price \$32.00

Adams in his original book published in 1955 compiled a text on removable orthodontic appliances which has been a boon for those with an interest in orthodontics. For many years Adams' book has simply and concisely elucidated the fundamentals of removable appliance design and construction. A revision of his original texts has given rise to the 5th edition and although the new text has been given an expanded title to include 'the use of' removable orthodontic appliances, the book is essentially similar to the 4th edition.

Principally Adams has reduced the overall number of chapters and altered the sequence of material presented. This has improved the flow of the clinical information which is presented in the first 8 chapters.

There is a separate chapter for technical procedures (chapter 9) and this is followed by an appendix devoted to material specifications.

In reviewing Adams' text one is left with a feeling of 'deja vu'. Although some illustrations have been improved and other minor changes made, the original theme has been retained. The preface gives an insight into Adams' philosophy where he states that 'removable appliances constitute a very large part of the needs of orthodontic management of any community today...'

I feel that this statement would not be endorsed by most orthodontists or general practitioners in Australia. For all the many salient features Adams presents in his new text, the major weakness comes from its lack of any diagnostic input. Figures 3.33 - 3.36 illustrate this point for there is no diagnosis of the problem, or mention of retention. This omission may lead the inexperienced to use the text as a 'picture book' diagnostic aid. In the section on rotation of teeth (chapter 5), Adams takes great care in the design of the orthodontic appliance, but does not mention over-rotation, retention or percision.

(Over-rotation is only mentioned in Figure 5 5D) It was disappointing that even with the addition of 'the use of' removable appliances in the title there was not a section dedicated to problems associated with the management of removable orthodontic appliances e.g. the insertion visit and monitoring of treatment progress.

This revised text has many fine sections which have been a feature of the previous editions, but essentially it suffers from the 'sin' of omission. The 5th edition would be a useful addition to the library of the practitioner interested in orthodontics, but it does not seem to offer the completeness necessary to live up to its title.

Michael W. Shearer

Myofascial Pain and Dysfunction - The Trigger Point Manual

by Travel, J.G. & Simons, D.G.

Published by Williams - Wilkins, Baltimore/London 1983. Price \$130

This is the first of two planned volumes. It deals with myofascial pain and dysfunction of the 'upper half' of the body. Janet Travel, now in her mid-eighties, has lectured and demonstrated her techniques and concepts in diagnosis and treatment of myofascial pain for many decades. David Simons has assisted in compiling this volume, adding clinical and laboratory neurophysiological verification to much of his co-author's material. An extremely comprehensive survey of both medical and dental literature makes the first five chapters a valuable reference for any dental practitioner interested in unravelling the confusion and misunderstanding surrounding this subject.

The glossary introduces the reader to terminology which centres around Trigger Points. Many dental definitions and terminology are included. This is indicative of the strong influence that dental research and dental practitioner treatment of pain dysfunction has had on Drs. Travel and Simons.

The clinical characteristics of Myofascial Trigger Points are described in general terms and the significance of referral of pain to other sites is stressed. This is important when related to the major sections of the volume, which describe individual muscles and the diagnosis and treatment of myofascial pain and dysfunction related to each of these muscles. It would appear that the accurate examination and location of offending trigger points requires a great deal of experience and tactile sense. It can be assumed that this is not going to be acquired from any text. However, the recognition of muscle pain with local spot tenderness as an important entity in the diagnosis of head and neck pain will be significantly enhanced by a study of this volume.

Perpetuating factors which influence trigger point activity in persistent myofascial pain syndromes are extensively covered and well documented. Mechanical stresses are considered of major significance and this would be our clinical observation in dentistry. Nutritional inadequacies, with particular reference to vitamins, are well covered with smoking, caffeine, alcohol and oral contraceptives receiving attention. Other factors covered are metabolic and endocrine inadequacies, psychological factors and chronic infections. Screening laboratory tests which are recommended to identify possible perpetuating factors are serum vitamin levels, a blood chemistry profile, complete blood count with indices, the erythrocyte sedimentation rate and thyroid hormone levels. These tests may well be worthy of consideration in patients exhibiting persistent dysfunctional problems.

Once trigger points have been located the authors primarily use two methods of treatment. The first of these is stretch and spray, where the offending muscle is passively stretched and the skin overlying the offending trigger point sprayed with vapocoolant. The vapocoolant

recommended is Fluori-Methane because of the inherent dangers in using Ethyl Chloride. It would appear that skill development in location and treatment of trigger point problems would be best served by stretch and spray techniques using Fluori-Methane rather than more invasive procedures.

The second treatment modality of trigger point injection is used routinely by the authors. The technique is explained for individual muscles as well as extensive coverage of the principles apropos of all muscles. 0.5% procaine in isotonic saline without epinephrine is the recommended drug and reasons for using this in preference to the widely accepted local anaesthetics in dentistry are given. Vapocoolant sprays and hot packs are used in conjunction with the injection of anaesthetic. I do not think that this technique should be used by dentists without extensive practical experience under supervision. It should be remembered that both authors are medical practitioners.

Other methods of treatment are not overlooked. These include massage, stretch without spray, ultrasound, heat, drug therapy, biofeedback, and transcutaneous electrical stimulation. However, when muscles are looked at individually and treatment methods outlined, it is stretch and spray, and injection and stretch which receive all the attention.

The description of individual muscles is comprehensive. Pain patterns related to muscles either directly or referred are illustrated in diagram. Actions of the muscle are covered, as are symptoms which can be expected and treatment techniques.

Chapter 5 of this volume is titled 'Head and Neck Pain — and — Muscle Guide and Introduction to Masticatory Muscles.' Section A is a valuable differential diagnosis check list of muscles which may be involved in pain in a particular area and directs the reader to a comprehensive study of individual muscles.

Section B reviews the literature on myofascial pain dysfunction syndrome and temporomandibular joint anatomy. The relationship to myofascial trigger points is discussed. It is interesting reading and would be of value to anyone involved in delivery of dental service.

Part 1 of the text is concerned with muscles which will be of significance to the dental profession. Sternocleidomastoid is described as 'amazingly complex' and most of us would concur with this. Muscles of mastication are given extensive coverage. Lateral Pterygoid muscle is sublabelled 'TMJ dysfunction', and its role in this area is now perhaps better understood than was the case at the time of the text going to press.

This book is a valuable addition to the literature for those concerned with the treatment of pain and dysfunction of head and neck. Athletes and sportsmen who have briefly perused this book during the time it has been in my possession have suggested it may provide new hope in their search for relief of aches and pains generally.

Peter Sutherland

Diet and Dental Caries

'Diet and Dental Caries' is the subject of a new nutrition information leaflet produced jointly by the Dental Health Foundation - Australia and the Australian Nutrition Foundation.

It is intended for use by intelligent members of the public and discusses the development of dental caries under the following headings:

- Susceptibility
- Fermentable carbohydrates
- Natural sugars in food
- Oral micro-organisms
- Saliva
- Oral hygiene
- Anti-cariogenic factors in food
- Fluoridation

Attention is drawn to the dietary guidelines produced by the Commonwealth Department of Health, in particular to those applicable to the maintenance of good dental health. Practical recommendations for good eating practices are also provided.

These leaflets are available from the Dental Health Foundation — Australia, the University of Sydney, N.S.W. 2006 Telephone (02) 660 8808.

Joan Steel

Dietary Guidelines for Australians.

Nutrition Section, Commonwealth Department of Health, Canberra.

Available on request. No Charge.

Diet-related diseases account for about 60% of deaths in the Australian population. It is widely accepted now that dietary modification can reduce the mortality and morbidity associated with such diseases.

Dietary guidelines have been developed by many countries including Australia. This 20 page booklet prepared for use by Australians briefly discusses the facts behind each of the guidelines and makes suggestions as to how they can be followed. Practitioners interested in promoting good health through better nutrition will find this a useful publication.

Joan Steel

THESIS REVIEWS

Lee, S.F.Y.

(A radiographic cephalometric study of the craniofacial morphology of cleft lip and palate individuals)

Melbourne M.D.Sc. (1983)

This study investigated some of the factors which influence the craniofacial development of complete cleft lip and palate individuals. Lateral cephalograms of 30 unilateral cleft lip and palate (UCLP) and 13 bilateral cleft lip and palate (BCLP) adolescents were analysed and compared with that of a well-matched control sample.

It was found that the UCLP subjects had significant maxillary deficiencies contributing to their concave facial profiles whereas the BCLP subjects had more variable facial profiles depending on the fate of their premaxillae (excised or preserved). Contrary to findings of other studies, the mandibular morphology was found to be similar in both the cleft and control groups in this study which points to the fact that early maxillary expansion may have some beneficial effects on the normal development of the mandible in these cleft subjects.

It was also found that the facial profiles of the cleft subjects became more concave with age (between 13 and 19 years) due to complete arrest of maxillary growth while growth of the mandible continued. This lack of growth in the maxillary complex was postulated to be related to post-surgical scar tissue formation which restricts the forward and downward movement of the maxilla during normal development.

Sokol, B.N.

(Tensile properties of orthodontic wire)

Melbourne M.D.Sc. (1984)

This study was designed with three aims in mind. Firstly, to investigate the tensile properties of a wide range of commonly used orthodontic wire. Secondly, to evaluate the tensile properties of a new alloy known as near alpha titanium. Thirdly, to investigate the effects of heat treatment on cobalt — chromium — nickel alloys.

The apparatus utilized included an Instron tensile testing apparatus and a Pye Mini Oven. The results indicated that 1. the range of stainless steel wire manufactured by A.J. Wilcock showed a graded variation

in tensile properties, 2. the 0.40mm (0.016") round Wilcock regular possessed superior tensile properties to that of the similar sized Permachrome wire. Quantitatively percentages were given for the improvement in tensile properties of Blue Elgiloy for a variety of heat treatments.

Mention was made of the inadequacy of tensile testing compared to clinical practice and proposals were put forward for further research.