Multiple Stafne Bone Cavities: A Diagnostic Dilemma

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Abstract: Salivary gland inclusions in the mandible are relatively uncommon. If defects occur they are generally unilateral, although bilateral cases have been reported. This article describes an unusual case in which the dental panoramic tomogram revealed three radiolucent areas in the mandible. The diagnosis of the two posterior radiolucencies was confirmed as Stafne's bone cavities but a definite diagnosis for the parasymphyseal lesion remained elusive, even after surgery. However, Stafne's bone cavities are known to occur in this region and this diagnosis remains the most probable.

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Clinical Relevance: This case report illustrates an unusual presentation in which a patient's dental panoramic tomogram revealed three radiolucent areas in the mandible and addresses the diagnostic dilemma faced by the operator.

Well defined oval or elliptical radiographic abnormalities anterior to the mandibular angle were first reported by Stafne.[1] The lesions are usually situated below the inferior alveolar canal and above the inferior cortex of the mandible, between the angle and the third molar tooth,[2] although lesions have been described in other areas of the mandible, including the ascending ramus[3] and the incisor, premolar and canine regions.[4] Various terms have been suggested to describe the lesions and they are commonly referred to as Stafne's bone defect, cyst or cavity.[3,5]

The incidence of bone cavities has been assessed from panoramic radiographs as 0.48%[6] and 0.4%[7] for the extensively male populations examined in the respective studies. Lingual defects have a predilection for middle-aged or older men[2,7] but have been identified in males aged as young as 11 years.[8] Defects are generally unilateral, although bilateral cases have been reported.[1,9]

Diagnosis of Stafne's bone cavities (SBCs) is usually based on a characteristic radiographic appearance although sialography,[10,11] computed tomographic scanning[12] and sialography with surgical exploration[13] have been advocated as diagnostic tools. A negative finding on sialography may not be significant, as lesions do not consistently contain salivary tissue.[5] Computed tomography (CT) has been employed to classify bone cavities by outline and content and to distinguish SBCs from centrally occurring lesions.[12] Surgical exploration and the removal of tissue for histopathological examination have also been reported to be diagnostic in atypical cases where the diagnosis is questionable.[3]

This paper presents a case of multiple SBCs in which sialography and CT were used to confirm the provisional diagnosis made from radiographs. An atypical cavity in the anterior region of the mandible was explored surgically.

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CASE REPORT

A 57-year-old man was referred to the Manchester Royal Infirmary Oral Surgery department by his general dental practitioner for further investigation of a radiolucency apical to the $\overline{/8}$ which extended beyond the edge of the periapical radiograph (Figure 1). At the hospital consultation, the patient admitted to being a heavy smoker and that he drank excessively in the past but stated that he was not drinking at that time. Intra-oral examination revealed $\underline{43/34,}$ $\overline{/2458}$ and $\overline{3/}$ present, all of which were carious. The lower left third molar was not painful at this time. There was no clinical evidence of swelling of either

***Figure 1.** Periapical radiograph showing a corticated loculated radiolucency overlying the bone inferior to $\overline{/8}$.*

Figure 2. *Dental panoramic tomogram demonstrating corticated radiolucencies in the right and left posterior bodies of the mandible and left parasymphyseal region.*

the mandible or the submandibular salivary gland.

Radiographic Findings

The dental panoramic tomogram (DPT) revealed three radiolucent areas in the mandible (Figure 2). A corticated ovoid radiolucency (2 x 1 cm) below the roots of $\overline{/8}$ and beneath the left inferior dental canal, and a smaller (1 x 1 cm), partially corticated radiolucency under the inferior dental canal in the right mandibular body, were evident. A third corticated radiolucency was seen in the left parasymphyseal region, below and distant to the apex of $\overline{/3}$.

The provisional radiological diagnosis was of multiple SBCs.

Management

The patient's medical notes revealed that he had been an alcoholic for over 30 years and had undergone a number of admissions for 'drying out'. The other medical items of note were a long history of gastric problems, tuberculosis and chronic bronchitis. Extraction of the lower left third molar under local anaesthesia was uneventful and, despite the likelihood of alcoholic liver damage, there was no postoperative haemorrhage. The remaining teeth were subsequently removed in stages, under local anaesthesia.

Sialographic Findings

Right and left submandibular gland sialography was performed on a Phillips MultiDiagnost 3 digital fluoroscopic unit (Phillips, Eindhoven, Netherlands) with intraductal injection of Omnipaque 300 (Nycomed, Birmingham, UK). Both glands showed mild sialectatic changes but normal emptying. Ducts were demonstrated overlying the two posteriorly located radiolucencies, consistent with SBCs.

CT Findings

CT was employed as a means of confirming the inconclusive sialography findings for the anterior lesion. Axial scans (Figure 3) of the mandible, 1 mm in thickness, were performed on a Phillips SR4000 scanner at 120 kV and 180 mAs. A Phillips Easyvision Dental software protocol was used to reconstruct cross-sectional (in a plane perpendicular to the line of the mandibular arch) images of the mandible (Figure 4). CT showed the presence of well-defined rounded low-attenuation defects in the mandible bilaterally in the third molar regions (Figure 4a, c) and in the left parasymphyseal region (Figure 4b). In

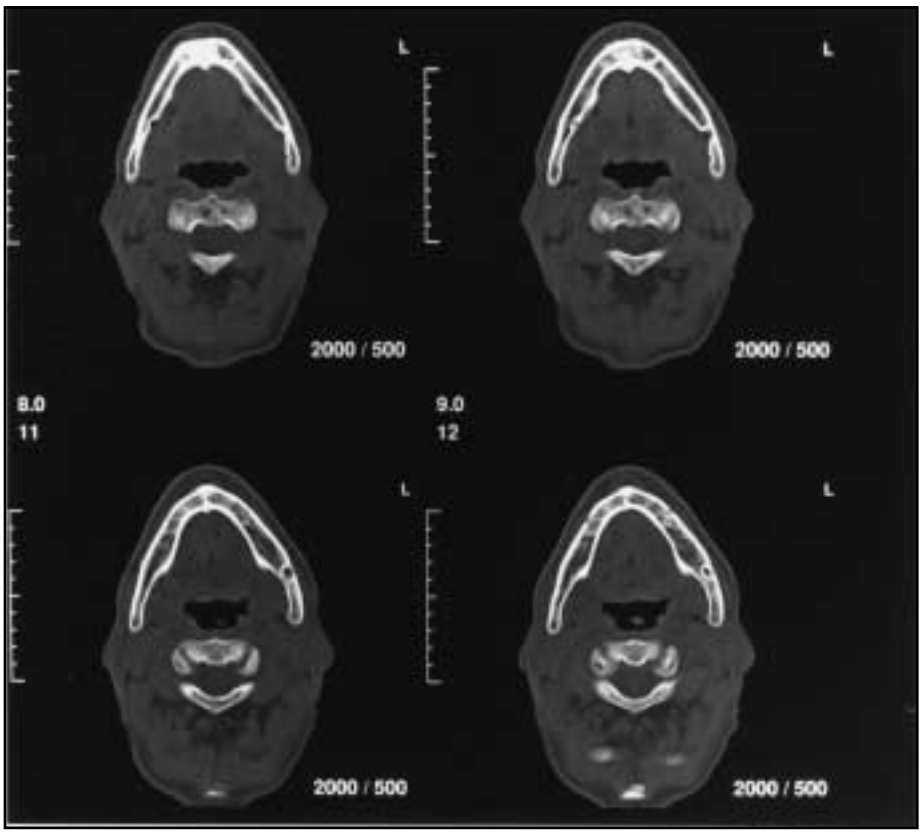
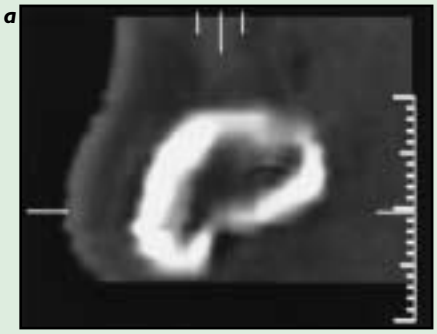


Figure 3. *Axial CT showing well-defined concavities on the lingual aspect of the mandible bilaterally. In the left parasymphyseal region a well-defined compartment within the bone can be seen, but no defect in the lingual cortex is visible.*



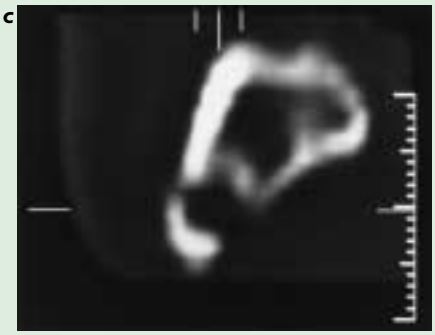


Figure 4. *CT cross-sectional reconstructions through the sites of the three jaw radiolucencies:* ***(a)*** *right posterior body of mandible;* ***(b)*** *left parasymphyseal region;* ***(c)*** *left posterior body of mandible.*

the posteriorly located lesions there were cortical bone defects on the lingual aspect of the mandible, consistent with the diagnosis of SBC. However, no such defect was associated with the anterior lesion.

Surgical Exploration

The two posterior radiolucencies were confirmed as SBCs at the conclusion of all imaging investigations. A decision was made to carry out surgical exploration of the third (atypical) lesion, in the left parasymphyseal region, under local anaesthesia and intravenous sedation. A labial mucoperiosteal flap was raised from the right premolar region to the left and the cortical plate was removed in the /$\overline{23}$ region. No obvious soft tissue pathology was found, although histopathological examination revealed normal bone and peripheral nerve tissue.

DISCUSSION

General dental practitioners would expect occasionally to encounter periapical lesions on radiographs taken to plan extractions. This paper presents the case of a patient whose DPT revealed three radiolucent areas in the mandible (Figure 2). Two of the radiolucent areas, in the posterior part of the mandible, have a characteristic appearance and location so that they are readily recognizable as SBCs. The third corticated radiolucency, identified in the left parasymphyseal region, below and distant from the apex of /$\overline{3}$, was difficult to diagnose clinically, even after surgical exploration and histopathological examination.

The Stafne bone cavity is a lesion for which no clear aetiology has been established. Probably the most widely adopted view is that the concavity develops as a result of pressure resorption from adjacent structures; the submandibular gland[4,13] or facial artery.[14] The resorption process would be expected to be slow, and this may account for the absence of defects in younger adults.

It is well recognized that alcoholism can be associated with an enlargement of the major salivary glands (sialosis). Sialosis is a non-inflammatory, non-neoplastic recurrent bilateral swelling of salivary glands. Most cases affect the parotid glands but the condition has been recognized in the submandibular and sublingual glands. The cause is unknown but cases have been reported associated with alcoholism.[15] The patient in the current study had a history of alcohol abuse, and it is tempting to postulate that alcohol-related sialosis may have given rise to the development of the bilateral SBCs in the posterior mandible. However, a definite diagnosis for the parasymphyseal lesion remained elusive, even after surgery. The location of the lesion, distant from the teeth, meant that an odontogenic cause was unlikely. Of the non-odontogenic cysts, the solitary bone cyst was the most likely diagnosis, and the surgical findings were not incompatible with this diagnosis. However, the age of the patient and the site are not typical of a solitary bone cyst. SBCs are known to occur in this region and this diagnosis remains the most probable, not least because of the presence of the two other lesions.

CONCLUSION

This case report illustrates an unusual presentation of three radiolucent areas in the mandible. Two of the radiolucent areas, in the posterior part of the mandible, were readily recognizable as SBCs owing to their characteristic appearance and location but a definite diagnosis for the third corticated atypical radiolucency in the left parasymphyseal region, below and distant from the apex of /$\overline{3}$ remained elusive, even after surgery.

Acknowledgement

The authors would like to thank Professor Rood, under whose care the patient was investigated.

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BOOK REVIEW

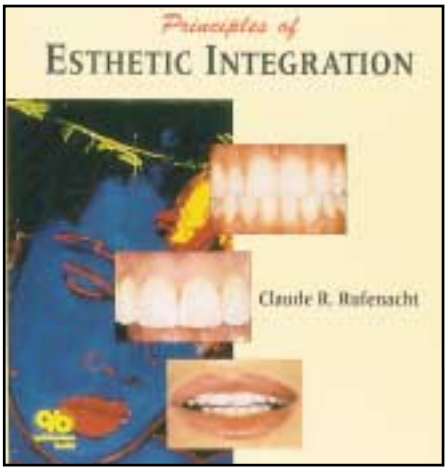
Principles of Esthetic Integration.
Claude R. Rufenacht. Quintessence Publishing Co., New Malden, 2000. (248pp. £82). ISBN 0-86715-369-5.

"However pleasing a restoration may be, it may well represent a perfect example of functional illusion and reveal itself as intrusive to the gnathic system".

Robert Lee.

Claude Rufenacht published the seminal text *Fundamentals of Esthetics* in 1989. In the period since that publication, aesthetic dentistry has become a major growth area worldwide, and is now an important part of dental practice. Since aesthetics has been defined as the art and science of relating shapes and colours in a state of harmony, Dr Rufenacht's latest book is of relevance. Its stated objective is to help practitioners develop their own individual knowledge of aesthetic principles and to integrate dental elements harmoniously into the particulars of facial design.

Readers expecting a 'how to do it' technique manual are likely to be disappointed, but instead will be offered many illustrations of the results of techniques, demonstrating the principles of aesthetics and the wide variety of aesthetic problems which may be addressed. Chapter 1 addresses function and form, the dental components, the periodontal components and the perioral components, the relationship of all being considered to be a farrago of clinical, aesthetic, biometric, anthropometric or morphopsychological imperatives. In Chapter 2, biological integration is discussed, with useful sections on tissue management, including peri-implant tissue management, and the pontic-gingival unit. As could be anticipated



from the book title, the chapter on aesthetic integration is a *tour de force* and covers over 100 pages. The subject is discussed in depth, with the relevance of points, lines, planes and forms all being defined and addressed. The author includes many diagrams and clinical illustrations to put across his concepts. By contrast, functional integration receives fewer than 40 pages, but contains useful sections on occlusal stability, eccentric interferences and tooth wear control. The final chapter addresses the principles of aesthetic set-up, and includes an interesting section on the integration of the mandibular anterior segment – a sometimes neglected aspect of dental aesthetics.

This book includes a wealth of excellent illustrations – both diagrammatic and clinical, which help explain its concepts to the reader. Those practitioners developing an interest in the area of aesthetic dentistry may find the book of value, but might be well advised to read the author's first text before reading this one, as this latest book builds on the concepts and knowledge discussed in the earlier text.

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ABSTRACT

HOW BIOCOMPATIBLE ARE THE NEWER DENTAL MATERIALS?
Biocompatibility of a Resin-modified Glass-ionomer Cement Applied as Pulp Capping in Human Teeth.
A.B. Nascimento, U.F. Fontana, H.M. Teixeira and C.A. Costa. *American Journal of Dentistry* 2000; **13:** 28-33.
Although not referred to specifically in this article, the work of Kakehashi *et al.* is seminal to this research. They showed that pulpal inflammation only occurs in the presence of bacteria, and their work showed that, in the absence of bacteria, dental materials in contact with the pulpal tissues produced no significant reaction.

The workers in this study placed either calcium hydroxide or resin-modified glass-ionomer on pulpal exposures in virgin teeth scheduled for orthodontic extraction, after arrest of haemorrhage. Strict aseptic technique was undertaken, and the samples were stained for evidence of bacterial contamination. No pain was reported by the patients.

The results showed that calcium hydroxide placed on pulpal exposures initially caused a zone of coagulation necrosis, but eventually resulted in pulp repair and dentine bridging. Resin-modified glass-ionomer, however, caused a persistent inflammatory reaction, and no long-term healing. It appeared that this reaction was caused by the displacement of cytotoxic components of the cement into the coronal pulp. This reaction may not be sufficient to destroy the pulp completely, and appears to be worse following wet bonding, when the cement does not fully polymerize, facilitating the dissolution of irritant and cytotoxic elements.

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