Differential diagnosis of stafne idiopathic bone cyst with Digital Volume Tomography (DVT)

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Abstract

Objectives The distinction between a pseudocyst and an intervention demanding cyst or process cannot always be found by 2D radiology. The differential diagnosis of a pseudocyst may become more difficult when adjacent processes are present.

Case A symptom free 67-years-old man presented with a periapical radiolucency around the mandibular left second molar as well as at the impacted 3rd molar. A comparison with an older panoramic x-ray showed no expansion during a 27 months period. The new panoramic x-ray and additional Digital Volume Tomography (DVT) showed asymptomatic separate dental cyst at the impacted wisdom tooth and the missing lingual cortical border in the apical region of the 2nd lower molar. This finding along with clinical vitality of the 1st and 2nd left molars led to the conclusion that the presented pathology was a Stafne Idiopathic Bone Cyst (SIBC) which needed no surgical intervention.

Discussion The additional use of DVT 3D examination may help in diagnosis of SIBC prior to surgical interventions thus avoiding unwanted surgical intervention.

Keywords X-ray · DVT · Stafne Idiopathic Bone Cyst (SIBC) · Cone beam CT

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Introduction

The distinction between a pseudocyst and an intervention demanding cyst or process cannot always be distinguished by 2D radiography alone. So the use of 3D diagnostic such as CT scans and its variations are helpful in making the right diagnosis and the correct treatment plan is well described in the english scientific literature [1,2]. Cone beam CT and Digital Volume Tomography (DVT) are available for dentists and surgeons for clinical use as a valuable diagnostic tool. Here we present a case of Stafne Idiopathic Bone Cyst (SIBC) for which the DVT was used for quick diagnosis and also help avert unwanted surgical intervention. The differential diagnosis of a pseudocyst may become more difficult when adjacent processes are present.

Case

A symptom free 67-aged man came for a general check-up and during routine

Fig. 1 Initial panoramic x-ray with lesion in left mandible

radiographic examination using orthopantomogram x-ray a periapical lucency around the 2nd lower left molar as well as at the impacted 3rd molar (Fig. 1). A vitality test showed positive reactions at the 1st and 2nd lower left molars. There were no pathological clinical symptoms present. The patient refused any treatment at that time. 27 month later a control x-ray of this

untreated process in the lower left jaw region was taken (Fig. 2). The comparison of the panoramic x-ray with the 27-month older one provided no differences in the 2D dimension. For differential diagnosis a DVT by Kodak 9000 3D was taken (Figs. 3 and 6). The horizontal layer gives much more detailed information than a traditional mouth ground projection (Fig. 3). The new view

Fig. 2 Panoramic view 27 month later: defect without growing

Fig. 3 DVT hardcopy of the horizontal cut through the hard tissue defect

Fig. 4 Transversal layer with lingual missing cortical bone

Fig. 5 Vertical view with higher detailed resolution in region of interest than the panoramic view

Fig. 6 Pseudo 3D view for general orientation

the orovestibular section in good quality compared to traditional transversal layer projections (Fig. 4) helps the dentist to arrive at a better conclusion. Also the longitudinal section gives more detailed information than the panoramic view (Fig. 5 compared to Figs. 1 and 2). The DVT shows the presence of a 16mm long, 12mm high and 9mm wide bone defect. The lingual cortical border of the mandible is missing. There is no confluence between the dental cyst of the 3rd molar and the bone defect. The crestal border of the inferior alveolar nerve was intact (Fig. 4). So a malign invasive process was excluded. A pseudo 3D view gives a volumetric impression of the residual bone and the location of the cavity (Fig. 6). This is better seen in dynamic image movement on the

computer screen but can be used for orientation. No pain was elicited on palpation. The 3rd molar removal was refused by the patient. The presence of a Stafne Idiopathic Bone Cyst (SIBC) was assumed. The benign nature of the process could be verified with a high degree of certainty due to the use of DVT.

Discussion

Shimizu et al. showed variances in location of the Stafne bone defect as result of a different location of the submandibular gland [1]. Thus diagnosis is often a challenge [3–5]. Even if the usual location of SIBC is inferior to the mandibular canal in the third molar variant locations are described [1,4,6,7]. Our finding correlates with the

most unilateral occurrence described in literature [8]. The use of 3D diagnostic was helpful in our situation [1,2].

Conclusion

Cone beam CT can be easily operated by qualified dentists and surgeons, and can be used as an adjunct for in-office dental diagnosis of pathologies that are identified in routine dental radiography. The use of such advanced radiographic techniques reduce the waiting time for fine needle aspiration results for diagnosis of pathology. In cases like SIBC, such advancements reduce unwanted surgical interventions. This is well supported in recent literature, but the use of such diagnostic techniques requires appraisal and verification of the findings by an expert in the field.

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