



The Marvel of 3D Imaging: A Case of an Undetectable Condylar Split Fracture



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Abstract

Radiography has become one of the cornerstones for palatable diagnosis in the world of medical sciences. Even amongst our dental fraternity; the use of conventional radiographs in day-to-day cases has increased considerably over the past few decades. With the arrival of 3D imaging, the credibility of oral diagnosis has leapfrogged to a different level. The purpose of this article is to present a case of an undetectable split fracture of the condyle, only made perceptible, courtesy 3D imaging.

Keywords: Three-dimensional imaging; Bone fractures; Radiography; Oral diagnosis

Introduction

Imaging is one of the most important tools for dentists worldwide to not only diagnose difficult cases but also to design an effective treatment plan. Dentists routinely use 2-dimensional (2D) static imaging techniques, whether analogue or digital. Despite the imaging modality like orthopantomograph (OPG) which has become the global standard as a screening diagnostic tool; in some cases, findings such as the deepness of structures, the finer details

of a positive finding or the extent of the pathosis cannot be obtained and localized with 2D imaging. Three-dimensional (3D) imaging was developed in the early of 1990's and has gained a precious place in dentistry ever since. The advent of cone beam computed tomography (CBCT) has opened new horizons in the field of diagnostic imaging [1]. Hereby, we discuss a case of a condylar split fracture which was otherwise undetectable even with the aid of conventional radiography.

Case Report

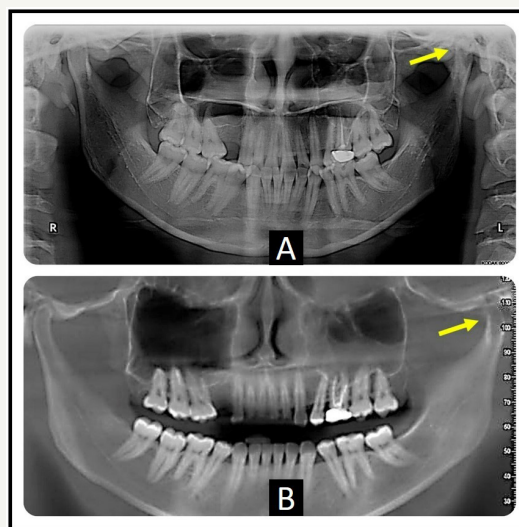


Figure 1: No Visible Fracture Seen On: A-An OPG Image, B-A Panoramic Image of CBCT.

A 29-year-old female patient reported to our facility with a chief complaint of intermittent pain on the left side of the face since, one month. She gave a history of a fall one month prior. Past medical, dental and personal histories were non-contributory. Extra-oral examination revealed pain localized to the pre-auricular region on the left side and was tender on palpation. An OPG image revealed

no abnormal findings (Figure 1). CBCT images revealed a distinct split fracture on the left condylar head extending about one cm in length which was undetectable otherwise (Figure 2). The patient was further referred to an oral and maxillofacial surgery for the needful.

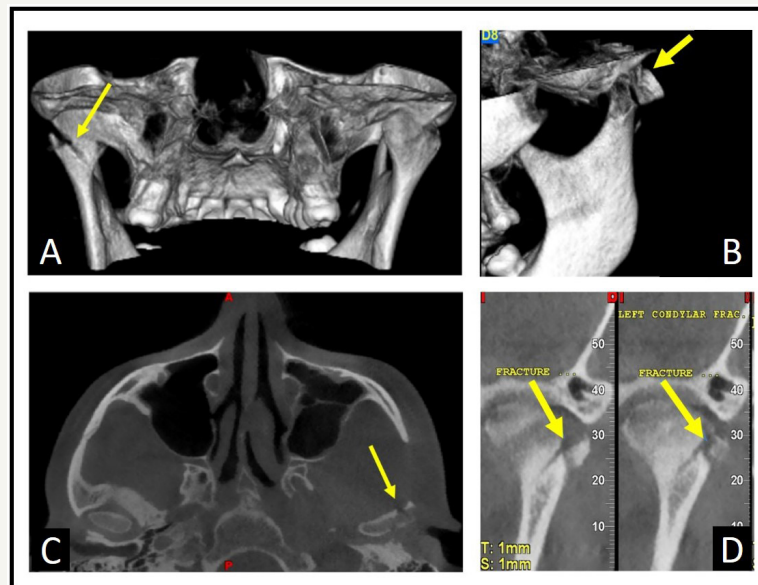


Figure 2: CBCT Images Showing Split Fracture of Left Condyle On: A-3D Image: Rear View, B-3D Image: Left Lateral View, C-Axial Slice, D-Cross-Sectional Slices.

Discussion

Facial fractures may occur in isolation or accompanied by tissue injuries. They may be symptomatic or asymptomatic. However, without timely diagnosis and adequate and appropriate treatment; serious functional, and esthetical problems may emerge [2,3]. Boeddinghaus and Whyte noted that while standard 2D radiographs may help in preliminary examination of maxillofacial trauma, diagnosis of an occult fracture may require tomographic imaging techniques, such as CBCT, that can provide excellent imaging of bony structures [4]. In line with this assertion, the occult fracture diagnosed by CBCT in the present case could not be distinguished by panoramic radiography. Maxillofacial trauma causes severe clinical problems because of the anatomical characteristics of the region and 34% of the cases are accompanied by major trauma [5]. 3D imaging is thus essential for locating anatomic and pathologic components and can provide views of both hard and soft tissue, whereas 2D projections are of limited use because of superimposition, magnification, distortion and misrepresentation of structures [6]. However, the emerging technique CBCT cannot be taken as the primary choice of imaging maxillofacial trauma due to lack of availability and increased radiation exposure. Nevertheless,

when weighing the advantages this imaging procedure could be the modality of choice depending on the case. Thus, CBCT seems to be a good complementary and not necessarily a substitute for panoramic radiography in trauma cases.

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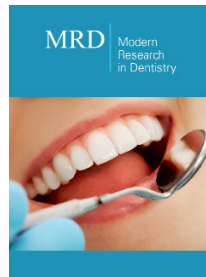
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