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Hemimandibulectomy With Mandibular Reconstruction as Management of Odontoma Complex; Case Report

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ABSTRACT

Introduction: Odontomas are the most common of the odontogenic tumours in the jaws and are characterized by their slow growth, asymptomatically, non-aggressively, and reaching no more than 3cm in diameter. Odontomas generally consist of unerupted or impacted teeth and retained deciduous teeth. This case report presents a rare case of complex with a large-size odontoma, measuring more than 3 cm in diameter, in the left posterior of the mandible along with impacted teeth. The lesion was removed with a hemi mandibulectomy. Case Report: A 24-year-old woman came with the chief complaint of a mass in the left lower jaw for 3 years. On clinical examination, a mass appeared in the left mandibular edentulous ridge with firm boundaries and a solid consistency, with no palpable Christ or crepitation. Incisional biopsy was performed, and the diagnosis showed it was fibrous dysplasia. Treatment was carried out with a left hemi mandibulectomy and reconstruction with a plate under general anaesthesia. The tumour defect was sent for anatomical pathology examination and the results showed the impression of a complex odontoma. Discussion: Odontomas are the most common odontogenic tumors and are classified into benign, mixed, and calcifying odontogenic tumors. Odontomas are generally found between the ages of 1 and 30 years, with the incidence occurring more frequently in women. These lesions occur more frequently in the lower jaw than the upper jaw. In this case, the patient is a 24 years old female. Although the cause is not yet known for certain, possible causes of odontoma may include traumatic injury to primary teeth, hereditary factors, and genetic disorders. In this case report, the odontoma was large and the extensive lesion had caused damage to the surrounding structures. Because the mass of the lesion was large and widespread, a radical hemi mandibulectomy was performed on the left mandibular region. Concussion: Odontomas are odontogenic tumors that most often occur in the jaw and can be found by dentists during routine examinations accompanied by panoramic radiography. Although odontoma is asymptomatic and has limited growth, potency, early diagnosis, and surgical excision are necessary to avoid complications such as cystic changes and malocclusion due to displacement of adjacent permanent teeth

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Introduction

Odontomas are the most common of the odontogenic tumours in the jaws and are characterized by their slow growth, asymptomatically, non-aggressively, and reach no more than 3cm in diameter. It is composed chiefly of enamel and dentin, along with a variable amount of cementum and pulp. They usually arise from epithelial and mesenchymal components of dental apparatus, which are able to produce all of the above. Odontomas are considered to be hamartomas (a tumour-like malformation), not a true neoplasm. Odontomas generally consist of unerupted or impacted teeth and retained deciduous teeth. Odontomas are encountered at any age, mostly evident in the 1st and 2nd decades of life, with a female predilection (da Rocha Leódido et al., 2015; B. P. Kumar et al., 2019; Neville et al., 2023; Preetha et al., 2010; Santos et al., 2016).

Based on radiographic and microscopic characteristics, odontomas are subdivided into compound and complex types. They usually appear radiopaque, having similar radiodensity as that of the tooth, which is surrounded by a narrow radiolucent rim in association with an unerupted tooth. Histologically, compound odontomas consist of multiple structures resembling small, single-rooted teeth contained in a loose fibrous matrix, whereas complex odontomas demonstrate disorganized masses of matured tubular dentin, interposed by circular spaces filled by enamel matrix (Neville et al., 2023; Santos et al., 2016).

Case Report

A 24-year-old woman came with a complaint of a mass in the left lower jaw. The mass appeared 3 years ago, initially small, then enlarged to its current size. There were complaints of pain but no mass anywhere else. On clinical examination, there was an edentulous bone in the left mandibular region; a mass was seen in the buccal and lingual edentulous bone in the left mandibular region with clear boundaries and solid consistency, no crystal or crepitation. Extraoral and intraoral clinical photos of the patient can be seen in Figure 1. On panoramic radiography, teeth 18, 34, 35, 36, 37, 38 were unerupted and tooth 48 partially impacted Class IA horizontally, as can be seen in Figure 2.

.Figure 1. Pre-operative extraoral and intraoral clinical conditions

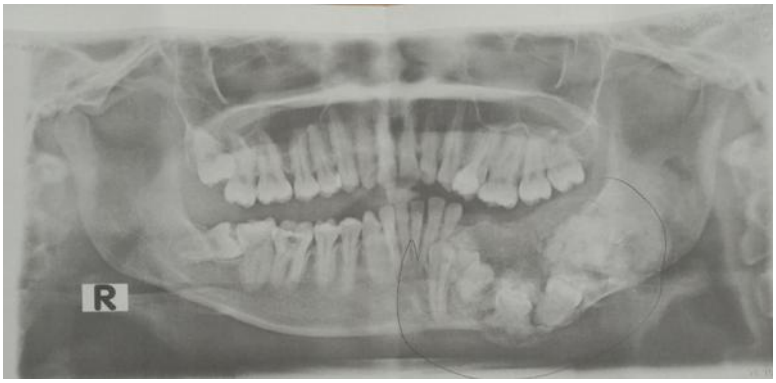

Figure 2. Panoramic radiograph

The MSCT image of the mandible (Figure 3) shows an expansile hyperdense lesion with a narrow transition zone, irregular shape, and edge at the parasymphysis-angulus accompanied by thinning of the cortex (size ± AP 2.8 x LL 2.1 x 5.2 cm), post-contrast injection there is enhancement, no bone destruction and no extension of the lesion to the surrounding soft tissue. A biopsy of the left lower jaw in the region of teeth 33-34 on July 3, 2023 showed lamellar bone plates, accompanied by swollen fibrous connective tissue stroma consisting of spindle-shaped cells with round oval nuclei, fine chromatin, eosinophilic cytoplasm, without osteoblastic riming, light infiltration of lymphocytes, histiocytes. No signs of malignancy. Impression of fibrous dysplasia.

Figure 3. MSCT Mandible

The hemi mandibulectomy began with marking the incision area with a pen marker and installing interdental wiring (IDW) in the upper jaw and right lower jaw regions with a 0.4 mm diameter wire. Then, pehacain was injected into the area to be incised. An incision was made in the left submandibular region up to the midline using a scalpel and blade no. 15. Furthermore, it was deepened until the tumour mass was visible in the left mandible (Figure 4) and the release of the left mandibular tumour from healthy tissue intraorally and extra orally (Figure 5).

Figure 4. Dissection

Figure 5. Release of the left mandibular tumour from healthy tissue

Then, tooth extraction 31 and resection in region 31 were performed using a gigglesaw, and TMJ disarticulation was performed (Figure 6). A post-mandibular resection tumour defect was

found from the anterior region 31 to the left condyle (Figure 7). Then intermaxillary wiring (IMW) was installed with a wire diameter of 0.4 mm (Figure 8).

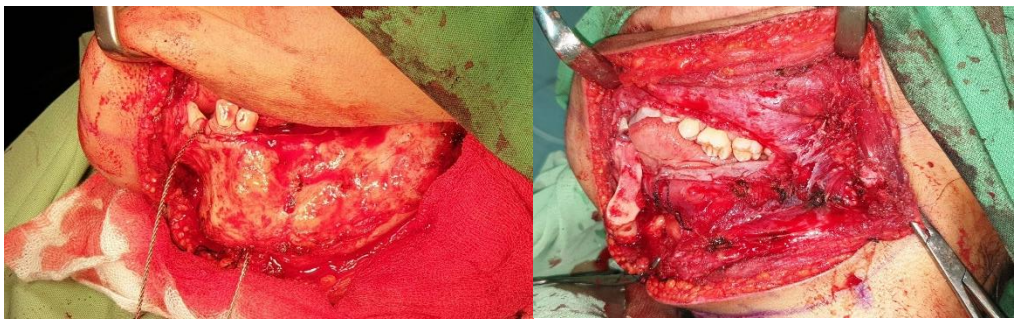

Figure 6. Resection with *gigli saw*.

Figure 7. Left mandibular tumor defect segment

Figure 8. IDW dan IMW

Next, reconstruction was performed with a plate (Figure 9) and insertion of a left mandibular vacuum drain. Then, suturing was performed with 2.0 vicryl thread on the inner side and 4.0 t-lene thread on the outer side of the skin (Figure 10).

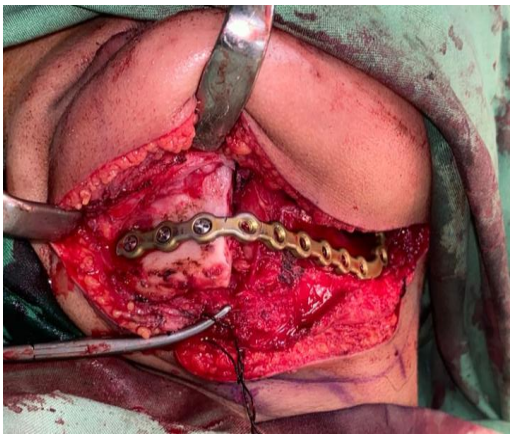

Figure 9. Reconstruction with plates

Figure 10. Suturing

At the 1-week visit after the hemi mandibulectomy procedure, the swelling was still visible on the left lower jaw, the postoperative wound was sutured properly, no dehiscence was seen, and the IMF and wire regio dextra were visible. At this visit, intraoral spooling and alternating suture aff were performed. Extraoral and intraoral clinical photos are shown in Figure 11.

Figure 11. Extraoral and intraoral clinical photos on day 7 after hemi mandibulectomy

On the 28th day post-hemi mandibulectomy visit, the eyelet was removed and a panoramic radiograph was taken for evaluation (Figure 12).

Figure 12. Panoramic radiograph post-op

The results of anatomical pathology of post-resection tumour defects preparation show odontogenic tissue consisting of enamel, dentin, and cementum arranged irregularly without forming a tooth structure between the fibrous connective tissue stroma containing fibroblasts. On the other plate, lamellar bone trabeculae are visible, among which the fibrous connective tissue stroma containing hematopoietic cells is visible. Also visible is a part of the bone that has undergone extensive calcification and does not appear malignant. The impression of an odontoma complex.

Result and Discussion

Odontomas are the most common odontogenic tumours and are classified into benign, mixed, and calcifying odontogenic tumours. Odontomas account for approximately 22% of all odontogenic tumours of the lower jaw. Approximately 10% of all odontogenic tumours in the lower jaw are compound odontomas. The incidence of compound odontoma ranges between 9 and 37% and complex odontoma ranges between 5 and 30%.4 Complex odontoma appears as a solid (radiopaque) and irregular mass on radiographic examination. This mass is usually located at the back of the lower jaw (mandible) and is surrounded by a clear radiolucent (dark area) border.1 In general, the radiographic appearance shows a radiopaque lesion (appears solid on X-ray) surrounded by a radiolucent halo. Odontoma radiographs can be divided into 3 stages according to the development of the lesion:

1. Stage 1: Radiolucent (dark appearance on radiography) indicates undeveloped hard tissue
2. Stage 2: Radiopaque occurs due to partial calcification
3. Stage 3: Radiopaque includes a thin halo, the most common condition

Radiographs of compound odontoma usually show a radiopaque shadow with a tooth-like structure, while radiographs of complex odontoma usually show a radiopaque mass that is irregular in shape and non-specific (Matsumoto & Saito, 2009; Neville et al., 2023; Pinto & Barros, 2012; L. A. N. Santos et al., 2016; Sarode & Sarode, 2014).

Odontomas are generally found between the ages of 1 and 30 years, with the incidence occurring more frequently in women. These lesions occur more frequently in the lower jaw than the upper jaw, and are more common in the posterior teeth than the anterior teeth. Complex

odontoma generally occurs in posterior teeth, while compound odontoma is usually found in young patients and in the anterior area of the jaw (Khan & Shah, 2008; Kumar et al., 2019; Kumar & Patel, 2015; Matsumoto & Saito, 2009; Santos et al., 2016). In this case, the patient is a 24 years old female patient. On clinical examination, there was an edentulous ridge in the left mandibular region, a mass appeared on the buccal and lingual edentulous ridge in the left mandibular region with firm boundaries and a solid consistency, no palpable clicking nor crepitation. The mass appeared 3 years ago, initially small then enlarged to its current size.

Although the cause is not yet known for certain, possible causes of odontoma may include traumatic injury to primary teeth, hereditary factors, and genetic disorders. In addition, several anomalies such as Gardner Syndrome, Hermann Syndrome, familial intestinal adenomatosis, and basal cell nevus are also associated with the incidence of odontoma. One aspect of odontoma etiology is odontogenic epithelial cells. When these tooth germs divide into multiple particles, they can develop individually into many closely located deformed teeth or tooth-like structures. When the germ develops without unusual divisions and consists of irregular tooth tissue, it can develop into a complex odontoma (Khan & Shah, 2008; B. P. Kumar et al., 2019; V. Kumar & Clark, 2012; Nasution & SItam, 2018; Pereira & de Oliveira, 2008; L. A. N. Santos et al., 2016).

Diagnosis of complex odontoma is carried out by clinical and radiographic examination. Radiographic examination will show a radiopaque (white) mass with clear boundaries. In some cases, a CT scan or MRI is also needed to get a more detailed picture of the extent of the tumour. The radiographic appearance of the odontoma complex is generally homogeneous radiopaque surrounded by radiolucency with clear borders (well-defined, soft tissue capsule border). Large complex odontoma lesions can disrupt surrounding structures, such as facial asymmetry, changes in the position of nearby teeth and damage to cortical bone (Johar, 2020; B. P. Kumar et al., 2019; Pereira & de Oliveira, 2008; Williams & Neff, 2007; Yadav & Sharma, 2010).

Differential diagnosis is an important part of treatment planning. Most patients are asymptomatic, and the lesions are detected incidentally by routine radiographic examination. Ossifying fibroma, calcifying odontogenic cyst, and Calcifying Epithelial Odontogenic Tumor need to be considered as a differential diagnosis because the radiopaque appearance occurs due to partial calcification or radiopaqueness surrounded by thin walls. The radio opacity of ossifying fibromas is slightly more emphasised than odontoma and is usually not radiopaque. Cement blastoma always fuses with the root of the associated tooth. Ameloblastic fibro odontoma shows a significant radiolucent component compared to the thin radiolucency observed in odontomas (Johar, 2020; Kumar et al., 2019; Neville et al., 2023; Santos et al., 2016; Sarode & Sarode, 2014).[18,19]

In general, treatment for odontoma is carried out by removing the mass through minor surgery because this lesion is usually small, grows slowly, and does not recur (Santos & Taveira, 2013; Santos et al., 2016). Surgical management of odontoma removal is surgical excision. has caused damage to surrounding structures, accompanied by impacted teeth and thinning of the mandibular cortical bone. Due to the large and extensive odontoma mass, radical hemi mandibulectomy excision surgery was performed on the left mandibular region (Bolan & Hong, 2005; Widayanti et al., 2017). If an odontoma mass is discovered early when the lesion is small, it can be removed by excision of the mass. In this case report, this could not have been done because the odontoma mass was extensive. Although in cases of odontoma, the possibility

of recurrence is rare, there may be other problems, especially in this case report, such as defects that arise after hemi mandibulectomy, which will be a problem in itself for the patient.

Conclusion

Odontomas are the most common odontogenic tumours found in the jaw. Dentists usually detect them during routine examinations and panoramic radiographs. Large odontomas that require radical surgical treatment to remove are very rare. Early diagnosis and proper management are essential to prevent complications.

While odontomas are often asymptomatic and have limited growth, early diagnosis and surgical excision are still necessary to avoid complications such as cystic changes and malocclusion due to displacement of adjacent permanent teeth. Although the recurrence rate of odontomas is low, wide excision is important in cases of complex odontomas.

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