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MANDIBULAR THIRD MOLARS IN THE SIGMOID NOTCH: A RARE STUDY AND CLINICAL MANAGEMENT

SİGMOİD ÇENTİKTEKİ MANDİBULAR ÜÇÜNCÜ MOLARLAR: NADİR BİR OLGU SUNUMU VE KLİNİK YÖNETİMİ

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ABSTRACT

Ectopic mandibular third molars (EMTMs) are uncommon, especially in atypical locations like the sigmoid notch. Their aetiology includes developmental anomalies, pathological conditions,trauma, and iatrogenic factors. EMTMs are uncommon and frequently asymptomatic, typically identified during routine radiographic examinations. Often associated with pathologies such as cysts and inflammation, EMTMs predominantly affect females after the fourth decade of life. This case report presents a 49-year-old male patient who presented with symptoms of swelling, limited mouth opening, and infection, attributed to an EMTM in the sigmoid notch associated with a dentigerous cyst. Radiological imaging revealed the precise location and extent of the EMTM and cyst. The choice of surgical approach, based on 3D imaging, should minimise risks and optimise outcomes. Surgical management involved an intraoral approach for extraction of the impacted tooth and enucleation of the cyst, leading to the resolution of symptoms and restoration of normal mouth opening. Literature review emphasises the significance of accurate diagnosis through advanced imaging techniques and tailored surgical strategies for the effective management of EMTMs.

Keywords: Ectopic third molar, sigmoid notch, dentigerous cyst

ÖZ

Ektopik mandibular üçüncü molar dişler (EMTM'ler), özellikle sigmoid çentik gibi olağan konumundan oldukça uzakta nadiren görülmektedir. EMTM etiyolojisinde gelişimsel anomaliler, patolojik oluşumlar, travma ve iatrojenik faktörler rol oynamaktadır. EMTM'ler genellikle asemptomatiktir ve rutin radyografik incelemeler sırasında tespit edilirler. EMTM'ler sıklıkla kist ve apse gibi patolojilerle ilişkili olarak yaşamın dördüncü dekadından sonra daha sıklıkla kadınları etkilemektedir. Bu olgu sunumu, sigmoid çentikte yerleşen bir EMTM ile ilişkili dentigeröz kist nedeniyle şişlik, ağız açıklığında kısıtlılık ve enfeksiyon şikayetleriyle başvuran 49 yaşında bir erkek hastayı rapor etmektedir. Klinik ve radyolojik muayene sonucunda EMTM'nin ve kistin lokalizasyonu ve etkilediği anatomik yapılar belirlenmiştir. Cerrahi yaklaşıma karar verilirken, üç boyutlu(3B) görüntüleme sonucunda elde edilen veriler göz önünde bulundurularak cerrahiden kaynaklanabilecek riskler en aza indirilmeye çalışılmıştır. İntraoral cerrahi yaklaşımla kist enükleasyonu ve gömülü diş çekimi ardından semptomlarda gerileme ve ağız açıklığında artış görülmüştür. Yapılan literatür taraması sonucunda EMTM'lerin etkin klinik yönetimi için doğru teşhis ve vakaya özgü cerrahi yaklaşımların önemi vurgulanmaktadır.

Anahtar Kelimeler: Ektopik üçüncü molar, sigmoid çentik, dentigeröz kist

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INTRODUCTION

Ectopic mandibular third molars (EMTMs) are relatively uncommon. They can occur in various regions of the mandible, such as the condyle, subcondylar, ascending ramus, sigmoid notch, and coronoid (1, 2). Some studies have indicated that ectopic mandibular third molars are more frequently observed in females and typically appear after the fourth decade of life. When considering their distribution, the condylar region is the most common site, followed by the coronoid process (3). Factors that may contribute to EMTMs include tooth development anomalies, pathological conditions, trauma, and iatrogenic causes (2). When a mandibular third molar is in an atypical position, it is commonly observed with pathologies such as cysts, hyperplastic follicles, and chronic inflammation (4). The diagnosis is often based on clinical signs, predominantly infection, pain, limited mouth opening, swelling, fistula, facial asymmetry, and temporomandibular joint (TMJ) dysfunction (3, 5, 6). Patients presenting with clinically limited mouth opening should be thoroughly evaluated because this condition may be associated with a history of trauma, infection, temporomandibular joint disorders(ankylosis, condylar hyperplasia, disc displacement without reduction), myositis ossificans, dental interventions, tumours such as osteochondroma, or radiotherapy (7). A comprehensive clinical assessment, detailed medical history, and appropriate radiological investigations are crucial for accurate diagnosis and management. Three-dimensional (3D) imaging is helpful in determining the most appropriate surgical approach, which may include intraoral, extraoral, or endoscopic procedures (8). This case report presents an EMTM in the sigmoid notch associated with a dentigerous cyst.

CASE PRESENTATION

A 49-year-old male presented to the Istanbul University Faculty of Dentistry complaining of swelling and limited mouth opening. During the examination, the masseter, medial pterygoid, and sternocleidomastoid muscles were affected. Panoramic imaging revealed an ectopic mandibular third molar (EMTM) in an inverted position within the sigmoid notch, leading to trismus and infection (Figure 1). In cone-beam computed tomography (CBCT), the affected tooth was located medially in the right sigmoid notch, with the crown positioned towards the outer surface of the mandible (Figure 2). CBCT revealed a tunnel-like lesion, which was a pathological cystic structure surrounding the tooth, extending from the surrounding tissue, causing destruction in the cortical layer. A radiolucent migration pathway extending to the anterior ramus was observed (Figure 3). An informed consent form and permission letter were obtained from the patient. After placing an extraoral drain, the patient was prescribed 600 mg clindamycin intramuscularly twice a day for 7 days and mouth-opening exercises (Figure 4). The tooth was extracted on day 7 when the mouth opening was 27 mm using an intraoral approach under local anaesthesia.

An incision was made along the anterior border of the mandibular ramus. A mucoperiosteal flap was elevated to reveal the retromolar trigone and external oblique ridges, reaching up to the coronoid process. A round steel bur was used to create a window in the anterior aspect of the ramus in the region identified in the preoperative radiographs (Figure 5). The tunnel-like bone destruction in the surgical field helped to determine the tooth migration pathway. The tooth was extracted by separating the crown and root into two pieces, and the cyst was removed (Figure 6).

After the extraction, the patient was prescribed 1 g amoxicillin orally for 1 week. Subsequently, the area was closed primarily, and no complications were observed. The pathological examination confirmed the preliminary diagnosis, revealing a dentigerous cyst and inflammation (Figure 7). The patient's mouth opening was 35 mm on the seventh postoperative day

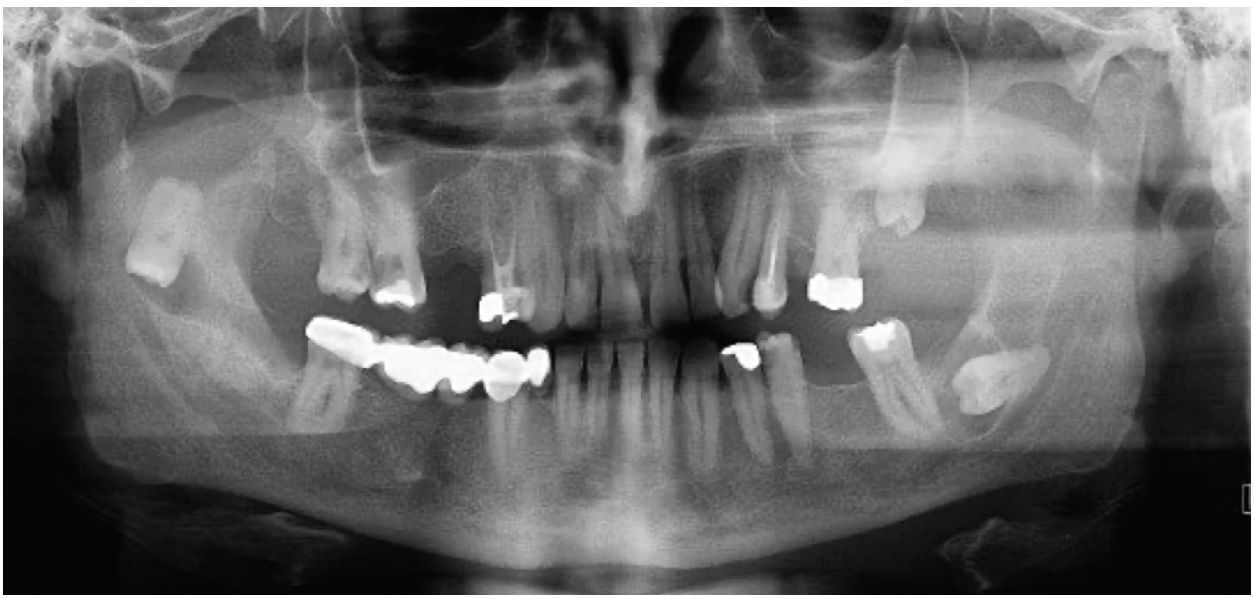

Figure 1: Preoperative panoramic radiograph showing that the third molar is located in the Sigmoid notch

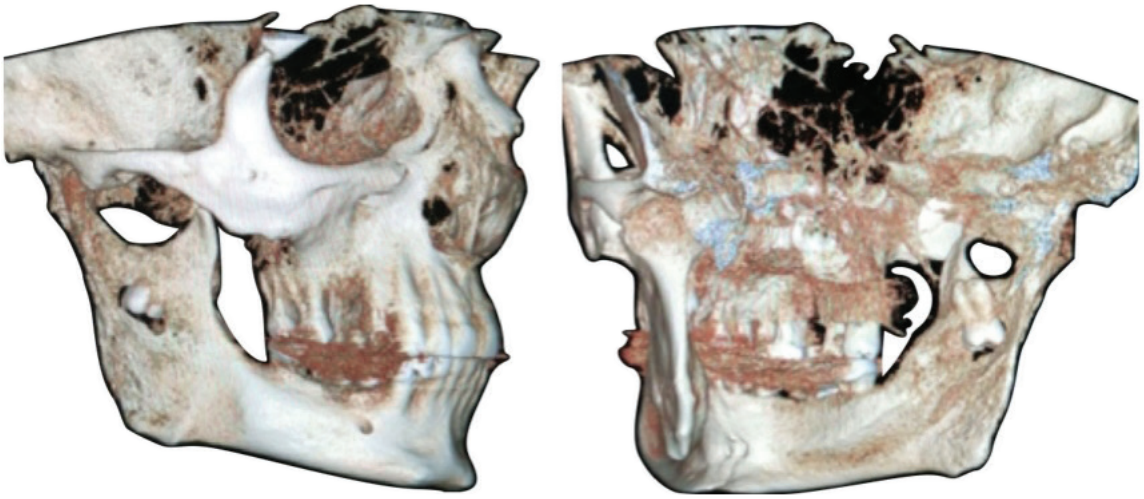

Figure 2: In the three-dimensional reconstruction of CBCT, the impacted tooth was found medially within the right sigmoid notch, with its crown oriented towards the external surface of the mandible

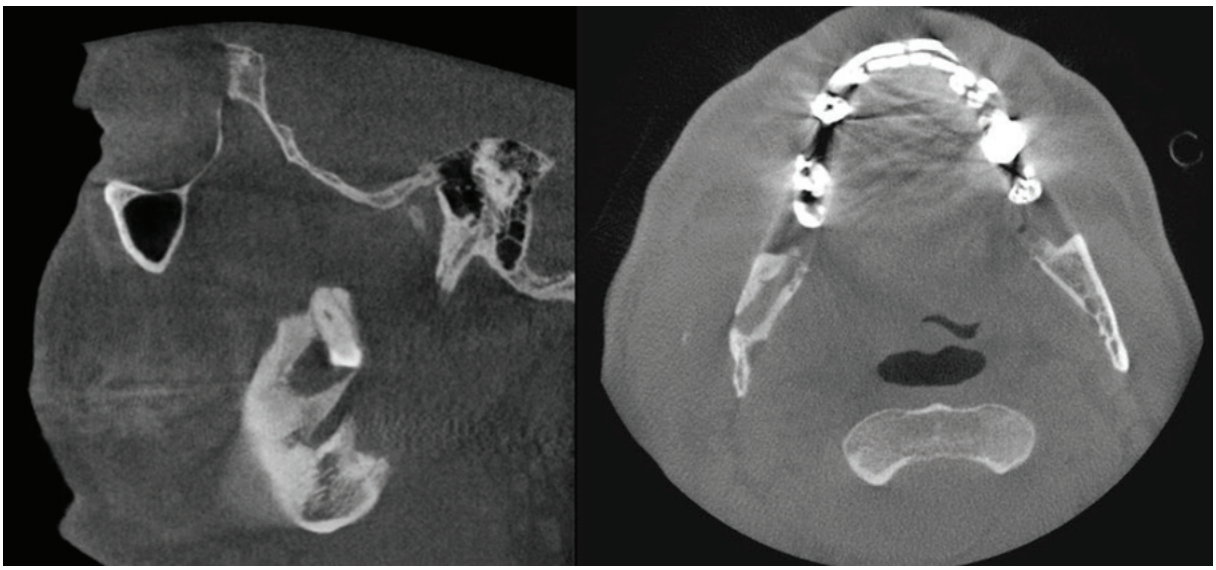

Figure 3: CBCT revealed a tunnel-like lesion, which is a radiolucent migration pathway extending to the right anterior ramus

Figure 4: The site where extraoral drainage is performed

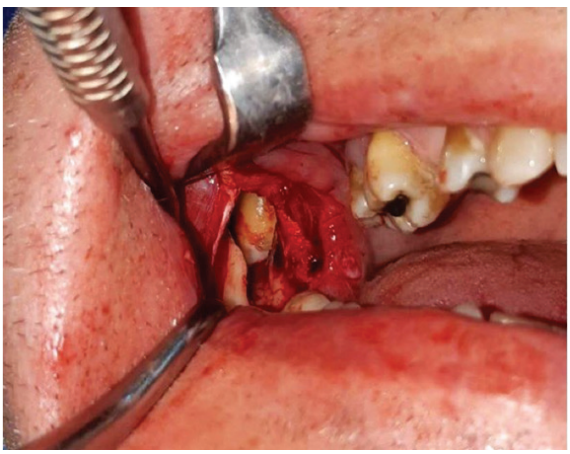

Figure 5: Exposure of the tooth in the sigmoid notch

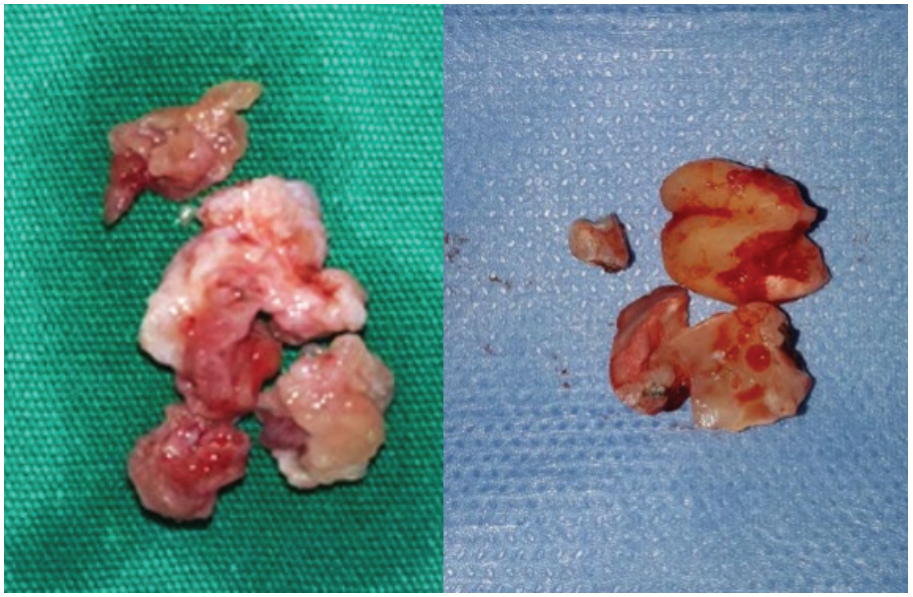

Figure 6: The image of the tooth and the cystic lesion

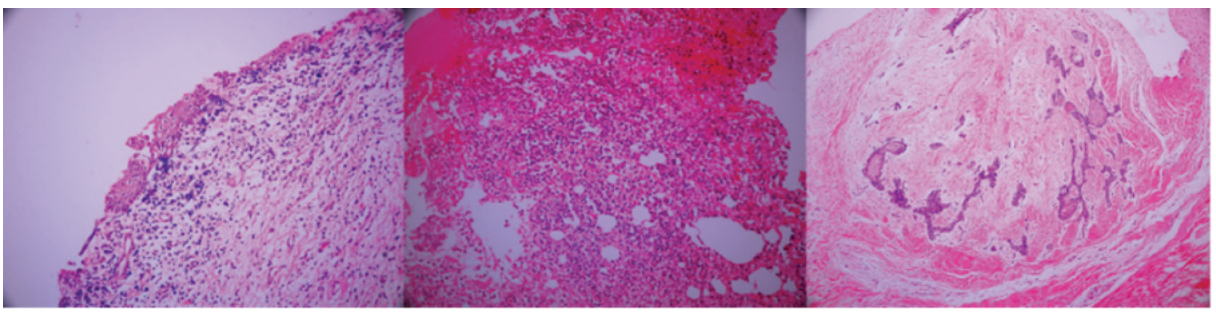

Figure 7: Histological image of the dentigerous cyst:the stratified epithelium demonstrating active inflammation (H&E 100x)

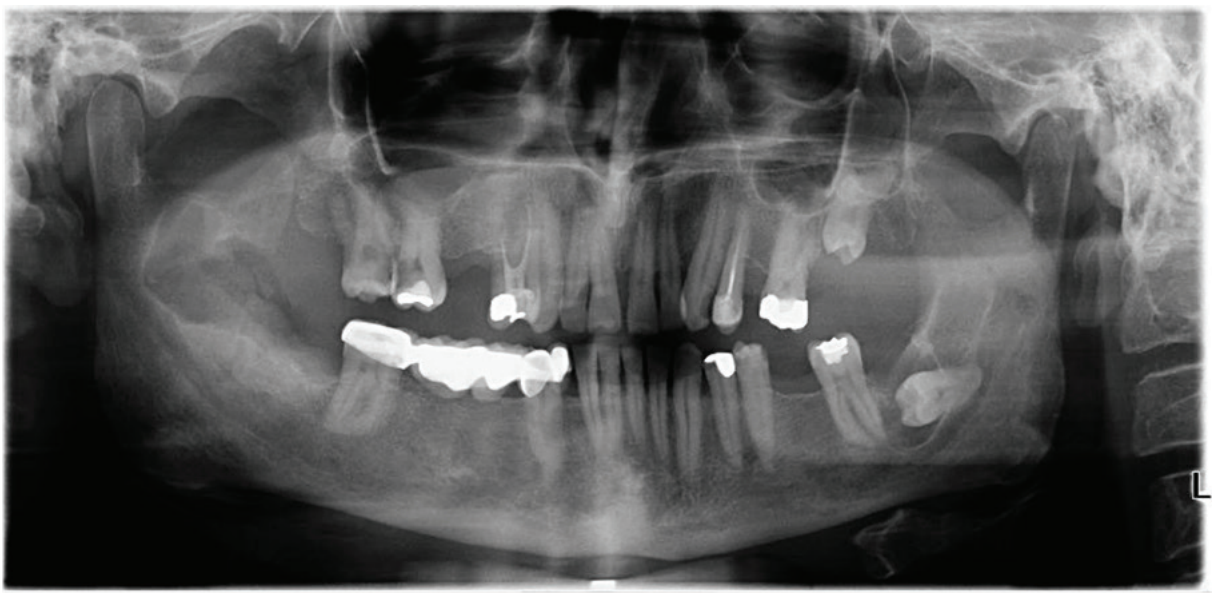

Figure 8: The panoramic radiograph on the seventh day of follow-up

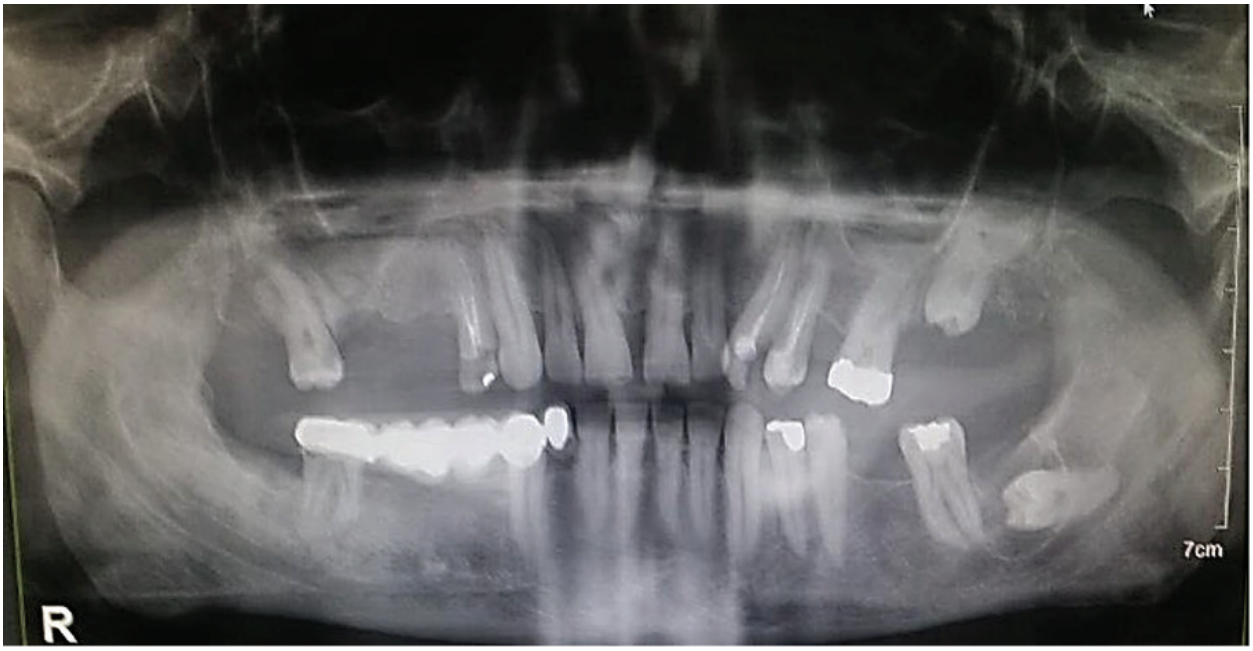

Figure 9: After 1 year of follow-up, the panoramic radiograph showed no signs of pathology and indicated bone healing

(Figure 8). Throughout the 1-year follow-up, the patient's mouth opening remained at 34 mm, with no reported symptoms, and panoramic X-rays did not reveal any pathology (Figure 9).

DISCUSSION

Ectopic teeth can occur in both the maxilla and mandible. In the mandible, they are located most commonly in the condyle and coronoid process regions, but they may also occur in the ascending ramus, lower border of the mandible, and sigmoid notch (6, 8, 9). Several theories have attempted to explain EMTMs, including trauma, abnormal eruption pathways, disruptions in the tooth root form, idiopathic causes, infection, craniofacial syndromes, cysts, and tumour pathologies. Capelli et al. reported a correlation between a decreased distance between the second molar and ramus and the likelihood of an EMTM (10). Adachi et al. reported that chronic inflammation in the coronal region could lead to the abnormal positioning of a tooth (11). Moreover, cystic fluids, particularly those associated with dentigerous cysts, have been suggested to be a potential cause of tooth displacement (12). The presence of a dentigerous cyst in our case, along with the displacement of the tooth, supports this theory. Another theory suggests that during the development of the lower third molar, it can be displaced due to the bone growth of the coronoid process (2). Following the classification of Wu et al., the EMTM in our case was positioned at level I in an inverted position and associated with a dentigerous cyst (13).

EMTMs are more common in women around the age of 40, although our case involved a male in his late 40s. Asymptomatic cases may be monitored annually based on the patient's health and tooth position. However, when an ectopic tooth coexists with the pathology, as in our case, surgery is inevitable. Without extraction and cyst enucleation, the risks include bone destruction, pathological alteration, bone weakening, and potential fractures.

While panoramic radiographs may be sufficient for diagnosing ectopic teeth, as in our case, 3D imaging is crucial to accurately determine the true position of the tooth and to assess the pathology. It also plays a significant role in selecting the surgical technique. In our case, a well-defined, radiolucent tunnel was observed, starting from the mandibular third molar and extending to the anterior edge of the ramus. In similar reported cases, the most common symptoms were pain, swelling, and trismus (13, 14). In our case, unlike the others, the trismus was severe due to the sternocleidomastoid muscle involvement. An intraoral approach provides a more aesthetic result, as it does not create an extraoral scar. It also avoids the possibility of damaging the facial nerve branches that can occur with extraoral approaches (14). The disadvantages of the intraoral approach include a limited field of view and the need to remove excessive bone to reach the tooth. In this approach, the retraction of soft tissues may cause damage to the lingual nerve (n. lingualis) and the inferior alveolar nerve (n. alveolaris inferior), which are in close anatomical proximity to the tooth. Excessive dissection and removal of bone to enhance the surgical field of view can increase the risk of soft tissue trauma and fractures (1, 5).

An endoscopic approach is very effective for minimally invasive access to this region. Endoscopic methods benefit from the magnification of the surgical field, improving visibility (15). However, using the equipment requires specialised training and the equipment is expensive (15). In our case, the following the drainage of the abscess, sufficient mouth opening was attained.

Intraoral access was deemed feasible in the 3D examination; therefore, an intraoral approach was preferred to mitigate the possible side effects associated with the extraoral approach.

CONCLUSION

EMTMs are rare. Asymptomatic cases can be followed up annually, while symptomatic cases require surgical intervention. The choice of surgical approach should be made according to the location of the EMTM. Three-dimensional radiological evaluation imaging is recommended for more precise planning.

Informed Consent: Written informed consent was obtained from patient who participated in this study.

Peer Review: Externally peer-reviewed.

Author Contributions: Conception/Design of Study- J.A., S.Ç., C.İ., T.K.; Data Acquisition- J.A., B.G.; Data Analysis/Interpretation- S.Ç., T.K.; Drafting Manuscript- T.K., J.A., B.G.; Critical Revision of Manuscript- S.Ç., C.İ., T.K.; Final Approval and Accountability- J.A., T.K., B.G., S.Ç., C.İ.; Supervision- S.Ç., C.İ.

Conflict of Interest: The authors declare that there is no conflict of interest.

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