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The Diagnosis and Management of Desmoplastic Ameloblastoma of the Maxilla A Case Report on Partial Maxillectomy with Obturator Fixation

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ABSTRACT

Desmoplastic ameloblastoma (DA) is a rare, benign, but locally aggressive variant of ameloblastoma, a tumor that typically affects the jaw and arises from odontogenic epithelium. DA is characterized by a dense fibrous stroma and is most commonly found in the mandible, although its occurrence in the maxilla is rare. This case report presents our experience with desmoplastic ameloblastoma in the maxilla, focusing on its clinical, diagnostic, and therapeutic features. The chief complaint was a slowly progressive painless swelling in the right maxillary region, which had been gradually increasing in size over the past 3 years. The medical history was non-contributory with no significant family history. Extraoral examination of the face revealed no facial asymmetry, swelling, or midline bony hard swelling in the face. On intraoral examination, there was a non-tender, immovable swelling. There was no evidence of suppuration or pus discharge. The swelling caused mild dysphagia (difficulty in chewing) and dysarthria (difficulty in pronunciation). Investigations confirmed the diagnosis of desmoplastic ameloblastoma. A CT scan showed an expansile lytic lesion involving the maxilla, and histopathological analysis of the excised lesion indicated a benign clinical course. The patient underwent right partial maxillectomy with obturator fixation, which involved excising the tumor and adjacent structures. The maxillary defect was reconstructed with prosthetic rehabilitation of the maxillary arch. The patient experienced good functional recovery, with improvements in speech and chewing, and there was no evidence of tumor recurrence on follow-up. The patient was satisfied with both the functional and aesthetic outcomes of the procedure.

1. INTRODUCTION

Desmoplastic ameloblastoma is a rare variant of ameloblastoma which is mostly locally aggressive, comprising of a dense fibrous stroma. While the tumor is mostly seen in the mandible, cases in the maxilla are a rarity. But if they are present in the maxilla, the proximity to sinuses, orbit and nasal cavity make it a surgical challenge as the resection and reconstruction must be planned meticulously in order to avoid a large functional and aesthetic deficit. We hope to present the diagnostic as well as surgical management of such a case and provide an approach to the same for future reference as well as add to the literature of maxillary reconstruction and prosthetic rehabilitation. In this case, the progressive swelling of the patient and a rare location of tumor in the maxilla made it a unique case in itself and also the only way to proceed was partial maxillectomy and obturator fixation to regain both function and aesthetics. This case would also help in understanding how surgical treatment followed by prosthetic rehabilitation would lead to excellent outcome.[1]

2. PATIENT INFORMATION

The patient is a 28-year-old female presenting with a gradually increasing, painless swelling in the right maxillary region for the past three years. The swelling was initially a small nodule with mild discomfort during mastication and palpation, but it did not significantly affect her quality of life. There were no systemic symptoms such as fever, weight loss, or night sweats. The patient denied any history of systemic conditions like diabetes, hypertension, or cardiovascular disease, and had no prior oral or maxillofacial issues, trauma, or family history of cancers. She also had no history of tobacco, alcohol, or drug use. The absence of pain and other acute symptoms led to a delayed diagnosis, as the tumor's slow progression and benign nature made it initially seem less concerning.[2]

Desmoplastic ameloblastoma is a rare, locally aggressive tumor typically found in the mandible, but less frequently in the maxilla. Its slow growth and lack of pain often result in delayed detection. Maxillary ameloblastomas, including the desmoplastic type, present complex treatment challenges due to their proximity to critical structures like the sinuses and orbits, requiring careful planning for surgery and reconstruction.

3. CLINICAL FINDINGS

Upon initial presentation, the patient, a 28-year-old female, presented with a chief complaint of a slowly progressive, painless swelling in the right maxillary region. The swelling had been gradually increasing in size over the past three years. The patient did not experience any significant discomfort or pain at the onset, and the lesion did not significantly impact her quality of life at the time of presentation. Extraoral examination of the face revealed no facial asymmetry or swelling. There was no midline bony hard swelling in the face. On intraoral examination, a non-tender, immovable swelling was observed in the right maxillary region. The swelling did not show signs of suppuration or pus discharge. The lesion caused mild dysphagia (difficulty in chewing) and dysarthria (difficulty in pronunciation), indicating the involvement of the maxillary structures.[3]

These clinical findings suggested a benign growth in the maxilla, though the slow, progressive nature of the swelling and the absence of pain or systemic symptoms made the initial diagnosis challenging. The absence of systemic symptoms such as fever, weight loss, or night sweats helped rule out more aggressive or malignant conditions.

4. TIMELINE

1. **Initial Presentation**:

The patient's symptoms began approximately **three years ago** when she first noticed **progressive swelling** in the right maxillary region. Initially, the swelling was small and non-tender, which led the patient to dismiss it as a minor issue. Over time, however, the swelling gradually increased in size, prompting the patient to seek medical attention. At this point, she reported mild discomfort, particularly when chewing, but there were no signs of pain, fever, or other systemic symptoms.

2. **Diagnosis**:
   The diagnosis of **desmoplastic ameloblastoma** was made after a series of **imaging studies** and **biopsy** results. In **December 2024**, the patient underwent **CT imaging**, which revealed a **lytic lesion** with calcifications in the right maxilla and involvement of the adjacent sinuses. This prompted further investigation through **biopsy**, which confirmed the presence of **desmoplastic ameloblastoma**, a benign but locally aggressive tumor. The **histopathological examination** of the biopsy sample showed the characteristic features of **dense fibrous stroma** and **calcified areas**, reinforcing the diagnosis.

3. **Surgical Intervention**:

Following the diagnosis, the patient underwent **right partial maxillectomy** with **obturator fixation** on **26th December 2024**. This procedure involved the surgical removal of the tumor along with a portion of the maxilla, followed by the placement of an **obturator** to restore function and appearance. The **maxillectomy** was performed to ensure complete excision of the tumor and to preserve adjacent structures as much as possible.

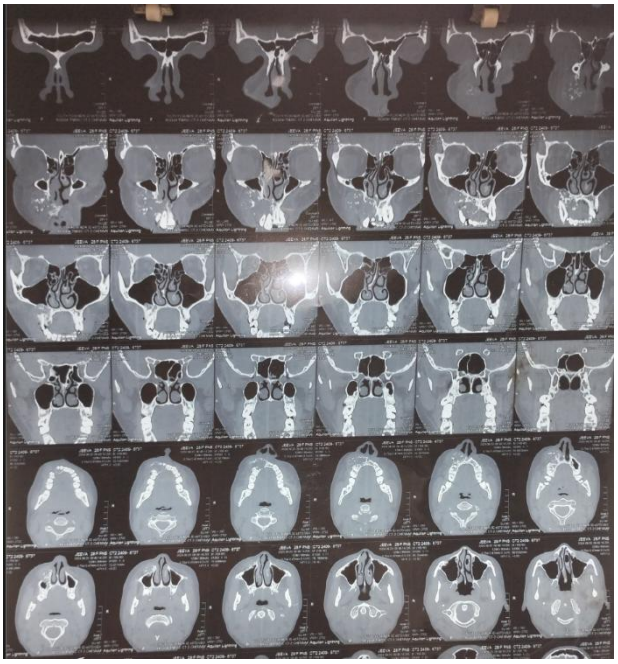
4. Post-Operative Outcome:

The patient's recovery post-surgery was **uneventful**, and she was **discharged on request** after a brief hospital stay. The discharge took place with scheduled **follow-up visits** to monitor the healing process, ensure there were no signs of complications, and check for recurrence of the tumor.

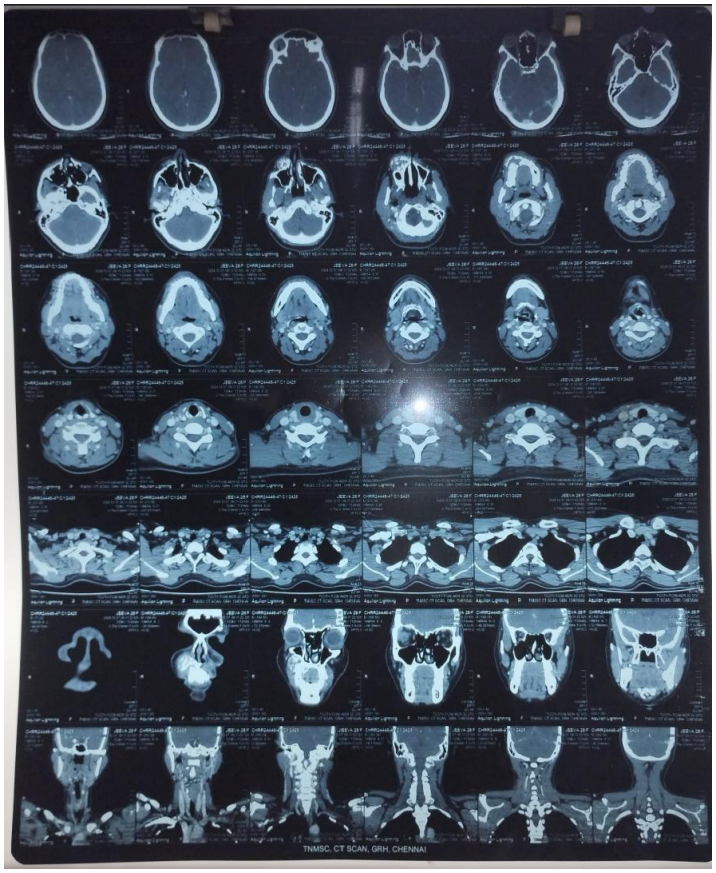
The patient was instructed to maintain proper oral hygiene, use the obturator regularly, and follow up with both the **ENT** and **dental clinics** for routine care. No recurrence was observed during the subsequent follow-ups, and the patient reported significant improvement in both **functional** and **aesthetic** aspects of her recovery.

5. DIAGNOSTIC ASSESSMENT

The diagnostic process in this case report was a complex one. The rarity of desmoplastic ameloblastoma was a primary challenge since this is an uncommon subtype of ameloblastoma. The common form of ameloblastoma typically presents more frequently and usually affects the mandible, making the presentation in the maxillary region with a desmoplastic variant less common and more difficult to suspect initially.[4] The patient's chief complaint was the progressive swelling in the maxillary area, which could have been easily misdiagnosed with any number of other maxillary conditions, especially because the growth was not immediately alarming. This initial misstep in diagnosis led to a delay in treatment, and as a result, the lesion was allowed to grow unchecked, which could potentially have made future treatment more difficult. As such, the lesion was initially assumed to be a benign growth based on the absence of aggressive features such as rapid growth or pain. Despite its slow progression and asymptomatic nature, this tumor can often be silent and gradual, leading to misdiagnoses. Ameloblastomas, although rare in the maxilla, often mimic other conditions like odontogenic cysts or benign tumors of the jaw.

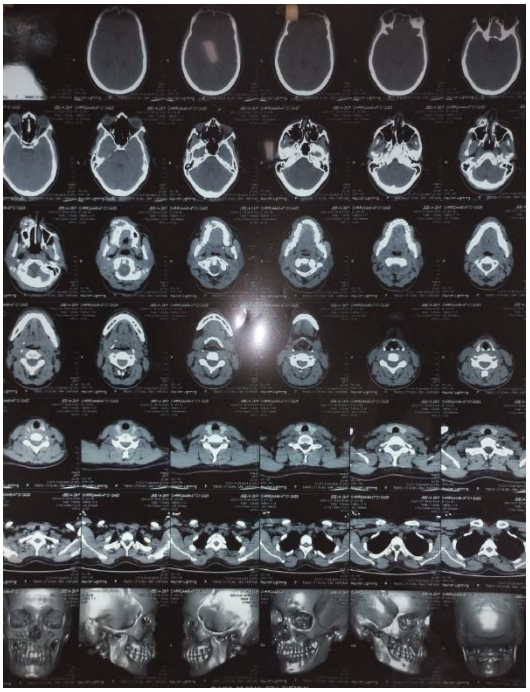


One of the differential diagnoses that must be considered in such cases of maxillary swellings includes squamous cell carcinoma, which can affect the maxilla and present with a mass or swelling in the affected area. In addition, the presence of multiple odontogenic cysts could also present similarly to the case, with a swelling in the maxilla, especially when there is a periapical radiolucency associated with a mandibular tooth. There are a number of odontogenic cysts that could also cause maxillary swellings that should be considered as well. Odontogenic keratocyst, dentigerous cyst, periapical cyst, and radicular cyst are all examples of cysts that could be considered as possibilities. Any lesions that were not completely benign, or not typically associated with the maxilla, were eliminated from consideration. There were no signs of malignancy or other systemic symptoms that are often present with squamous cell carcinoma. As the tumor is slow-growing and asymptomatic, the early swelling was mild and not characteristic of cancer or other malignant or aggressive tumors. For benign odontogenic lesions, both clinical and radiological manifestations could mimic an ameloblastoma, so it would not have been immediately apparent. For these reasons, a biopsy and further imaging were the necessary next steps.[5]



The biopsy was the most significant factor for confirming the diagnosis, as both the CT scan and MRI cannot alone confirm the presence of desmoplastic ameloblastoma. The CT scan provided significant information regarding the location, size, and effect of the tumor, but it was the histopathology that confirmed the diagnosis of a benign, although locally aggressive, tumor. CT scan is effective at showing the classic features of ameloblastoma, such as a lytic lesion with some areas of calcification. It was on the basis of these CT scan results that a desmoplastic ameloblastoma was initially suspected, and it is only through the biopsy that the diagnosis was confirmed. The CT scan information was a necessary pre-surgical assessment to understand the exact extent of the lesion, especially in relation to the maxillary sinuses and the periosteal bone. CT imaging would help determine if any of the adjacent vital tissue structures, such as orbital or nasal cavity, might be involved as well, which could complicate surgery and require additional interventions. The MRI was also critical for surgical planning and to fully understand the extent of the lesion. The CT scan was effective at showing the maxillary lesion and its extent into the surrounding areas, including maxillary sinuses, but the MRI provides a more detailed look at soft tissue involvement and impact. MRI was also effective at characterizing the soft tissue mass. Combined, the CT and MRI provided the surgical team with an excellent perspective on the extent, size, and location of the tumor. Once these had been determined, they could move forward with the most appropriate treatment plan.[6]

Histopathology was the last and final factor in the diagnostic process. Histopathology is considered the gold standard for the diagnosis of ameloblastoma, including desmoplastic ameloblastoma, so this was key in confirming the diagnosis. The biopsy results were key in this case and provided pathognomonic features that were characteristic of this type of tumor. In particular, tissue analysis revealed a fibrous stroma as well as a calcified matrix that is so specific to this tumor that no other differential diagnosis was able to be considered. In a biopsy of a desmoplastic ameloblastoma, dense fibrous tissue and calcifications are pathognomonic and would not be seen with other, more common lesions. This was the final confirmation that this patient had a desmoplastic ameloblastoma that was benign and locally aggressive. This allowed for the surgical team to move forward with full confidence in the knowledge that surgical excision would be both effective and curative.[7]



6. THERAPEUTIC INTERVENTION

After the diagnosis of desmoplastic ameloblastoma was confirmed, a comprehensive treatment plan was developed, with the main objective being the complete excision of the tumor while preserving the patient's functional and aesthetic aspects as much as possible. The chosen surgical approach involved a right partial maxillectomy, a procedure that is typically employed for benign tumors located in the maxillary region, especially when they are well-defined and confined to the bone without significant involvement of surrounding vital structures.

The surgical process began with the right partial maxillectomy, during which the tumor was excised with a clear margin to ensure that no residual tumor tissue was left behind. The resection aimed to remove the tumor entirely while preserving the adjacent structures, including the sinus walls and soft tissues, to the greatest extent possible.

Maxillary ameloblastomas, especially those located in the upper jaw, pose a significant challenge for surgeons due to their proximity to critical structures like the sinuses, nasal cavity, and orbital regions. This is why meticulous planning was crucial. The decision to remove the tumor with adequate margins was guided by the findings from the CT scan and MRI, which highlighted the tumor's boundaries and its involvement with nearby tissues. Ensuring the complete removal of the tumor without damaging these important structures was a delicate task. The success of this resection would significantly reduce the likelihood of recurrence, a major concern with ameloblastomas, which are known to have a tendency to reoccur if not fully excised.

Once the tumor was excised, the next step in the intervention involved the placement of an obturator. The obturator is a prosthetic device designed to restore oral function and prevent the deformity that can arise from such extensive surgeries. After the resection, the patient had a significant defect in the maxilla, which could affect her ability to speak, chew, and even swallow. The obturator was custom-designed to fit into the cavity created by the partial maxillectomy, effectively closing the defect and restoring normal function. Additionally, the obturator helped prevent the collapse of the remaining soft tissues and bone, providing support and preventing further deformity in the affected area. This step is crucial in ensuring that the patient can resume a normal lifestyle after surgery and avoid long-term consequences like speech impairment or difficulty eating, which could have otherwise resulted from the large surgical defect.

Post-surgery, the patient was closely monitored for any signs of complications. Post-operative care was an essential part of the treatment plan. Pain management was a primary concern, as recovery from maxillary surgery can involve significant discomfort. To manage pain and prevent infection, the patient was prescribed **Amoxiclav**, a broad-spectrum antibiotic, to prevent post-operative infections. Analgesics, such as **Paracetamol**, were also administered to manage pain effectively and ensure the patient's comfort. Additionally, to reduce inflammation and improve recovery, the patient was given **Serratiopeptidase**, an anti-inflammatory drug that helps in reducing swelling and promoting healing by breaking down fibrin and other inflammatory molecules. Given the nature of the surgery, which involved a significant resection of bone and tissue, the patient was also prescribed **Omeprazole**, a proton-pump inhibitor, to prevent acid reflux and promote

gastrointestinal healing, which is often compromised by stress and the administration of pain medications.[9]

The recovery process also included regular follow-up visits, during which the surgical site was carefully examined for signs of infection or complications, and the functional recovery of the patient was assessed. These follow-ups were critical in ensuring that the obturator remained in place and functioned effectively, as well as in monitoring for any recurrence of the tumor, which, though rare in cases of complete resection, remains a potential concern with ameloblastomas. The patient was encouraged to maintain good oral hygiene and to use the obturator as prescribed to avoid any issues with prosthetic retention or tissue irritation. Over time, the patient reported significant improvement in her ability to speak and chew, with no issues of discomfort or complication arising from the surgery or the obturator.

7. DISCUSSION

Desmoplastic ameloblastoma is challenging to diagnose due to its rarity, especially in the maxilla. It often grows slowly and is asymptomatic, which can delay diagnosis. Differential diagnoses include odontogenic cysts and squamous cell carcinoma of the maxilla. Misdiagnosis can lead to delayed treatment and poor prognosis. A biopsy is essential for confirming the diagnosis and preventing unnecessary treatments. Early detection is crucial for improving the prognosis of patients with this tumor.

The patient underwent right partial maxillectomy with obturator fixation, a standard and effective treatment for localized maxillary ameloblastomas. While this approach has a proven track record, recent advances in virtual surgical planning and 3D printing have enhanced the precision of maxillary reconstructions. These technologies may offer better outcomes in complex cases. The success of this patient's treatment supports the continued use of traditional methods, although newer techniques could improve results in more extensive cases.

Recent studies, such as one by Shah and Shah (2025), emphasize the role of dental implants and prosthetic rehabilitation in restoring function and aesthetics after surgery. Ongoing research into maxillary reconstruction and prosthetic rehabilitation underscores the importance of post-surgical care in achieving long-term positive outcomes.

8. CONCLUSION

In this patient, we saw the benefits of early detection and management of a desmoplastic ameloblastoma. The patient's treatment included a partial maxillectomy and obturator fixation, and her positive outcome and improvement in the quality of life support that this is a good treatment option for this condition.[10] However, other factors may be associated with outcomes in cases like this. For example, the patient's age, general health, and the size and location of the tumor can all impact her treatment and prognosis. Additionally, the skills and experience of the surgical team, the type of surgery, and the post-operative care the patient receives can also affect outcomes. The decision-making process for choosing a treatment option should be based on a thorough evaluation of the patient, tumor, and other factors that may influence outcomes. The surgeon should consider the patient's overall health, the size and location of the tumor, and the potential risks and benefits of each treatment option. In this case, the decision to proceed with a partial maxillectomy and obturator fixation was likely based on an assessment of the tumor's size and location and the surgeon's experience and skill. The surgical techniques used in this case, including the use of advanced imaging techniques and careful management of surrounding structures, are essential for achieving successful outcomes in maxillary ameloblastomas. The preoperative planning and surgical resection, as well as the post-operative care and prosthetic rehabilitation, were all critical components of the patient's successful recovery and rehabilitation.[11]

9. PATIENT PERSPECTIVE

The patient reported being very satisfied with the surgical outcome, especially in terms of her ability to eat and speak. The surgery and the use of an obturator allowed her to restore these basic functions, which she had been struggling with before the surgery. The patient also reported that she did not experience any significant changes in her appearance after the surgery. However, the use of an obturator helped her to maintain a normal appearance by filling the gap left by the resected portion of the maxilla.[12] Overall, the patient was very satisfied with the surgery, and she was able to return to her normal life with minimal disruption. The patient was able to resume her daily activities shortly after recovery, and she reported being able to eat and speak normally. The patient's satisfaction with her surgical outcome was mainly due to her ability to resume her daily activities and her confidence in her appearance. The fact that the surgery did not significantly impact her appearance and that she was able to speak and eat normally made a big difference in her life.[13]

Informed Consent

Informed written consent was obtained from the patient for the publication of this case report and the accompanying clinical details. The patient has reviewed and approved the content presented.

Authors' Contribution

All authors contributed equally to the conceptualization, diagnosis, treatment planning, surgical execution, follow-up, and

drafting of the manuscript. Each author approved the final version and takes responsibility for the accuracy and integrity of the case details provided.

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Nil.

Conflicts of Interest

The authors declare no conflicts of interest.

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