

Aseptic necrosis of maxilla following access surgery in juvenile nasal angiofibroma: Report of two cases.

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Abstract

Varied complications have always been part of the surgery in general and maxillofacial surgery is no exception. One such complication can arise post access osteotomy / transfacial approach to the skull base pathologies. Aseptic necrosis of the maxilla, though a rare entity, can be untoward sequelae of a transfacial approach to skull base pathosis. Aseptic necrosis also has been observed following trauma, uncontrolled diabetes and infection. Transfacial approach/Access osteotomy is sensitive procedure and the success of such procedure depends on thorough knowledge of regional blood supply of the osteotomised bone and skill of the operator. In the present case report, aseptic necrosis of the maxilla occurred following surgery for Juvenile Nasopharyngeal Angiofibroma (JNA). It was evident in both the cases that

ipsilateral transfacial approach/access osteotomy was undertaken to approach the skull base tumour.

Keywords: Aseptic necrosis, Juvenile Nasopharyngeal Angiofibroma (JNA), Complication.

Introduction

Maxilla is a bone of mesenchymal origin which incorporates various process for articulation with the skull base in a complex manner. Knowledge of this anatomy is foremost when surgically approaching the skull base. Vascular supply of maxillary bone has been extensively studied by Bell W H, Darab D & You Z¹. These studies have been carried out to design the biologic basis of incisions in the maxillary orthognathic surgeries to ensure adequate blood supply to maxilla. Maxilla derives its blood supply centrifugally from the alveolar medullary arterial system and the soft tissue mucoperiosteal arterial system which penetrates the cortical bone and supply

blood to the maxilla. In these studies it was observed that the multiple arteries and their anastomosis in the hard and soft tissues contribute to the biologic foundation for maintaining dento-osseous viability in spite of transection of the medullary blood supply after osteotomies. Maxilla receives its blood supply from the branches of third part of maxillary artery, facial artery and ascending pharyngeal artery² (Fig 1&2)³. Any injury to the branches of these arteries may compromise the viability of the maxilla.

It is often seen that surgeries in the para-nasopharyngeal and pterygomaxillary regions can efficiently be performed either endoscopically or open surgical approach through use of access osteotomy procedures particularly in case of large tumors.

Various open surgical approaches to the base of the skull⁴ are :

Transoral approaches

Transnasal approaches

Transfacial approaches

Transcranial approaches

Lateral approaches

Aggressive Juvenile Nasal Angiofibroma (JNA)/ Nasopharyngeal Angiofibroma is a rare sinonasal tumor which occurs almost exclusively in adolescent and young adult males. It is the most common benign tumor of nasopharynx accounting for 0.5% of all head and neck neoplasms⁵. The tumour is thought to arise from the pterygomaxillary fossa in the recess behind the sphenopalatine ganglion at the exit aperture of the pterygoid canal⁵. Although histologically benign JNA can be life-threatening owing to chances of bleeding and intracranial extension. Surgery for such tumor can be performed either endoscopically or through open approach. This report incorporates two cases illustrating aseptic necrosis of left maxilla following transfacial approach for excision of JNA.

Patients and Methods

Case 1

A 13 year old male patient reported to Department of Oral and Maxillofacial Surgery at Dr.R.Ahmed Dental College and Hospital in June'18 for the purpose of functional rehabilitation. Patient had difficulty in mastication and phonation with a nasal intonation. He presented with history of surgery in the post nasal region for an aggressive juvenile angiofibroma (JNA) in some other speciality of another hospital one month prior to presentation. Surgery was followed by exfoliation of teeth from the left maxillary alveolus (excepting for one) and loss of mucosa over complete left maxilla gradually over a period of month. On examination it was observed that left maxilla was just hanging with help of S.S. wire with patient having difficulty in eating and pronunciation. (Fig 3,4&5).

After a proper history, any underlying disease and trauma was ruled out. So also was the chronic use of any medication. Bone biopsy was performed to rule out fungal disease. Tissue was also collected from the surrounding soft tissues to rule out the same.

A diagnosis of post surgical aseptic necrosis of left maxilla was concluded and surgical plan was decided to remove the wire under L.A. & sedation. Left maxilla dropped off immediately after the wire was removed (Fig. 6&7). The bed showed tissue in various stages of healing. An impression was taken at the time of surgery (Fig. 8) and a temporary cover plate was delivered to the patient subsequently.

The defect created was a class 2⁶ and was restored with intermediate removable partial denture, after making an impression with hydrocolloid impression material (Fig 9) Final prosthesis (Fig 10) for the patient was fabricated subsequently. The patient was kept on follow up for a period of one year post denture insertion. He was

periodically checked for development of any further complications. The follow up period was uneventful.

Case 2

A similar case in a 14 yr. old male patient was referred to our department in August'18 with complaint of mobility of left front teeth three months back. Patient had difficulty in mastication and phonation with nasal intonation to his speech. History revealed surgery in the left nasopharyngeal region for juvenile nasal angiofibroma four months back and a possible access osteotomy procedure. On examination left maxilla was found in progressive aseptic necrosis with mobility of tooth no. 9 in the 2nd quadrant and exposed mini plate in the upper labial vestibule (Fig.11, 12 13&14).

However it was observed that on the posterior aspect of the maxillary defect there was a new growth of tissue (Fig.15). Hence the patient was referred to the department of E.N.T. of a neighboring medical college, where he had undergone the previous surgery. Possibility of recurrence was concurred and the patient was posted for further ablative surgery and follow up.

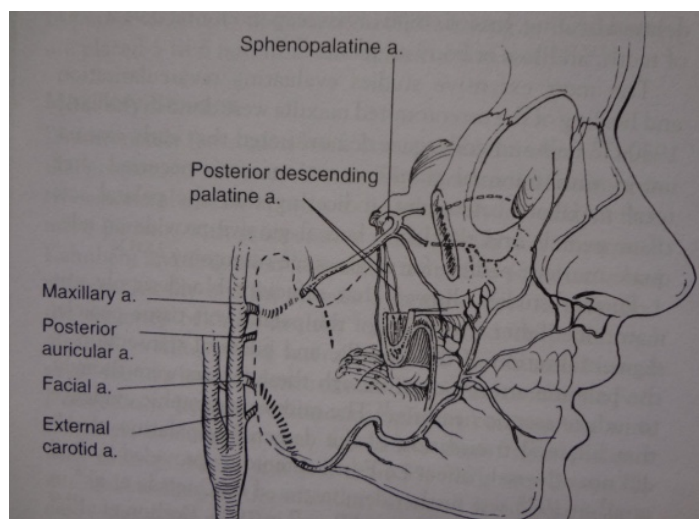


Figure 1

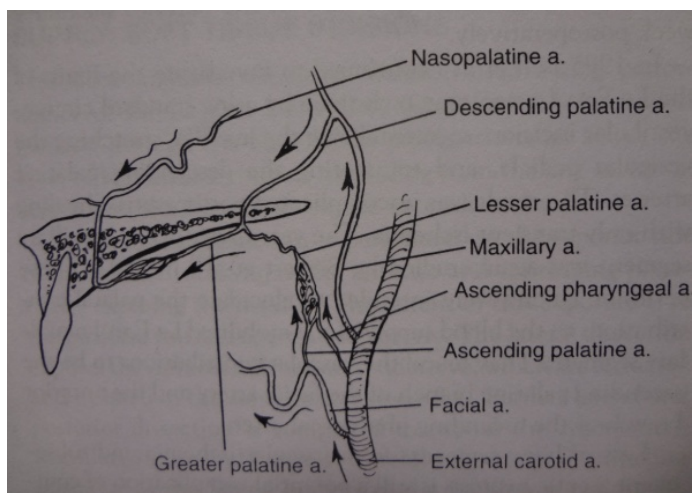


Figure 2

Figure 1 and 2: Blood supply of maxilla from branches of third part of maxillary artery, facial artery and ascending pharyngeal artery.



Fig. 3, 4 and 5: Extraoral and intraoral photographs of Case 1

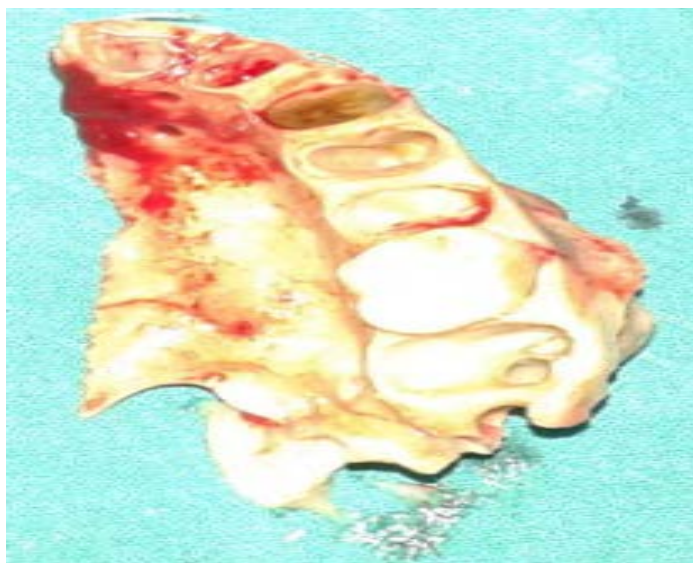


Fig. 6 :The necrosed maxilla.



Fig. 7: Intraoral defect.



Fig. 10: Fabrication of Final prosthesis



Fig. 8 : Impression of intraoral defect



Fig. 11: Case 2.



Fig. 9: Fabrication of intermediate denture.



Fig. 12: Intraoral view showing necrosed maxilla with miniplate



Fig. 13: Intraoral defect seen in a mirror.



Fig 14: OPG of same patient

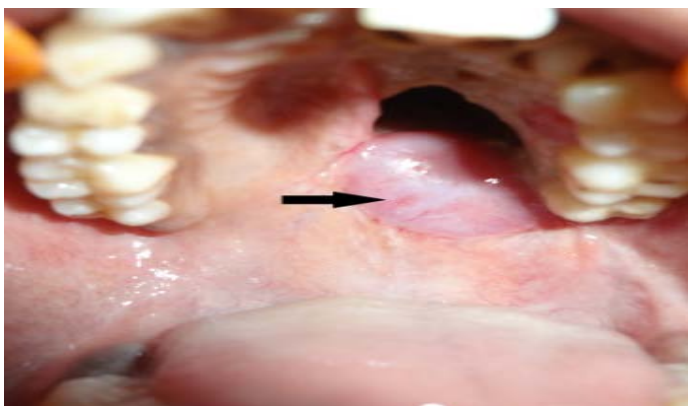


Fig 15: New growth of tissue.

Discussion

Meticulous handling of tissue and mastering the art to approach tumours is of utmost importance to avoid any complications. Loss of dentition followed by complete loss of maxilla is an adverse consequence of an elective surgery. Although rare but careless handling of tissue along with excessive periosteal stripping, inadvertent use

of electrocautery or ligation of major vessels supplying the maxilla or all together might result in aseptic necrosis of maxilla.

A similar observation was reported by Cornah J and O'Hare PM⁷, of complete necrosis of the maxilla following trauma. Behanan AG et al.⁸, also observed unilateral exfoliation of left maxilla in an uncontrolled diabetic patient. They found it to be secondary to the Mucormycosis.

Andrade NN, Karande V⁹, observed that proper diabetic control was the key in successful management of patients apart from surgical exploration and removal of the necrotic maxilla in a report of Chronic Suppurative Osteomyelitis.

In an observation by Migliorati C A et al.¹⁰, advance stage cancer patients receiving bisphosphonate therapy with aseptic necrosis of upper or lower jaw following extraction of tooth did not respond to local therapy, antibiotics or hyperbaric oxygen therapy. They termed such a condition as Bisphosphonate Associated Osteonecrosis. Also, Singh J et al.¹¹; observed aseptic necrosis of the anterior maxilla, eight years after Le-fort 1 osteotomy.

Literature review may allow us to suggest that a Lefort I access osteotomy down fracture to access the tumour would have been superior approach for accessing JNA¹². Management of aseptic necrosis of the maxilla with antibiotics and hyperbaric oxygen has been used successfully to control infections and ischemia respectively. It is difficult to reverse this aseptic necrosis¹³.

Treatment of bisphosphonate induced Osteonecrosis of the Jaw ranges from daily irrigation and antimicrobial rinses in stage 1, through long term antimicrobial therapy in stage 2, to surgical debridement / resection in stage 3¹⁴.

Conclusion

Though aseptic necrosis of maxilla is a remote occurrence, it can be associated with numerous conditions including trauma, infection, chemo & radiotherapy and surgery to the mid face. Such complication poses great challenge for the surgeon to rehabilitate the patient. Rehabilitation includes fabrication of maxillofacial prosthesis to osteo-cutaneous free tissue transfer with dental implants for restoration of function and form respectively. Such a venture would necessitate involvement of a multi-disciplinary approach. Herein, it is an additional mental trauma to a patient who, in looking for a cure, lands up in another problem and is emotionally scarred for life. Complications, though may arise in any surgery, it is imperative that a surgeon should not forget the statement of Greek physician Hippocrates..“Primum Non Nocere”.

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