Technical Note

# A Novel Modification of the Sagittal Split Osteotomy as an Access Osteotomy

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## Abstract

Pathologies present in the central zone of the mandible are difficult to access, primarily because of the presence of the inferior alveolar nerve (IAN) and the need to remove a large corticocancellous component to reach the area of interest. Many times, this bony window is replaced as a free graft and there is complete resorption in the long term or even rejection of the graft causing a bony defect which can weaken the mandible. Furthermore, the damage to the IAN is profound. To try and avoid these comorbidities the traditional sagittal split osteotomy was modified to access a central osteoma impinging on the IAN and the successful removal of the same without any comorbidities such as paraesthesia or loss of bone structure. We believe that this modification can be used for other scenarios such as benign cysts and difficult presentations of impacted teeth.

**Keywords:** Access osteotomy, bilateral sagittal split osteotomy, dysesthesia, osteoma

## Introduction

Osteomas are bone tumors that can occur anywhere in the skeleton.[1]

Osteomas are classified as:

1. Peripheral
2. Central
3. Soft-tissue variant.[2,3]

Osteomas are developmental anomalies caused by trauma.[4] Smaller masses are accidentally noticed and larger masses affect aesthetics.[5] Sometimes central osteomas cause compression of a nerve.[6]

Osteomas appear radiopaque and delineated from the surrounding jaw bone.[7]

Smaller asymptomatic lesions do not require any treatment. Osteomas that cause functional impairment or disfigurement need recontouring or complete excision. Mandibular osteomas can be treated by both intra-oral and extraoral approaches.[8-10] Two intraoral approaches are the sagittal split osteotomy (SSO)[11] and the buccal corticotomy.[12]

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The buccal cortical window approach increases the cortical defect on the buccal surface of the bone-weakening the body of the mandible, and there may be the increased propensity to the damage of the IAN.[12]

The traditional SSO may not allow adequate vision as well as the release of the entire stretch of the IAN within the mandible.

Therefore, a modification of the traditional SSO was preferred to allow clear access to the pathology, to allow freeing of the IAN along its entire length up to the mental foramen, and to avoid loss of bone in the body of the mandible.

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## Case Details

The patient is a 28-year-old male presenting with a chief complaint of constant pain in the right side of the face. The pain was continuous radiating up to the temporal region, starting from the body of the mandible. This was seriously hampering his quality of life. The patient presents with a history of assault to the mandible 6 years ago. The episodes of pain started 2 months after the incidence of trauma. He was treated by many consultants for pain relief but with no positive result. For relief from pain, the patient claims that he turned to tobacco abuse and alcohol. He was initially diagnosed elsewhere as suffering from trigeminal neuralgia and was treated with carbamazepine, but with no relief from pain.

He reported us complaining of severe dysesthesia along the course of the right IAN with pain radiating to the right temporal region. Diagnostic blocks of 2% lignocaine with 1:2,00,000 adrenaline were administered to the IAN. The patient had instant relief from pain after the inferior dental nerve block. This state of hypoalgesia persisted for 40 min with the pain recurring after the local anesthesia wore off. Routine investigations were done and the orthopantmography showed a small radiopaque lesion in the right body of the mandible. To achieve greater clarity a cone-beam computed tomography scan was done [Figures 1 and 2]. This showed a dense bony lesion close to the right inferior dental nerve. The lesion was well defined, rounded radiopaque mass suggestive of bony origin impinging on the IAN. We hypothesized that this lesion was a reactive osteoma resulting from the previous trauma to that region. The differential diagnosis may include central ossifying fibroma, condensing osteitis, idiopathic osteosclerosis, osteoblastoma, cementoblastoma, and complex odontoma[7].

The patient was explained the hypothesis and was offered the choices of either of the two: Decompressive surgery of the right IAN or neurectomy of the right IAN. The patient opted for decompressive surgery to avoid the permanent paraesthesia that would be caused by the neurectomy.

### Surgical technique

The procedure was done under general anesthesia with nasal intubation. The right hemi-mandible was accessed through a traditional vestibular incision with an additional anterior extension up till the symphyseal region with extreme care to preserve the integrity of the mental neurovascular bundle. The osteotomy cuts were placed starting from the lingual cut extending above and beyond the lingual, extending downward and forward along the ramus and extended to above the mental foramen region. This extension is the modification of the access osteotomy [Figure 3]. Preserving the mental nerve as it emerges from the foramen [Figure 4], two cuts were made above and below the foramen with the inferior cut being a thorough and thorough cut involving both the cortices (Epker's Modification) [Figures 3, 5 and 6]. Priorly, preplating was done to ensure that the mandible was placed back into its original position after the osteotomy [Figure 7]. Small osteotomes and a Smith spreader were used to split the mandible. The osteoma in its entirety was freed off the IAN with careful use of a Freer's elevator [Figure 8]. The nerve was preserved carefully [Figure 9]. At this point, a marked demarcation was seen between the osteoma and the inner surfaces of the buccal and lingual cortices of the mandible.

Flakes of the bone were seen attached to the IAN and these were removed. A bur was used to remove the walls of the inferior dental canal on both the inner cortices of the mandible. This was done to give more space to the nerve and enhance nerve function after decompression [Figure 9].

Within 24 hours the patient found instant relief. Mild postoperative pain was handled with pain killers over the course of a week. The patient had paraesthesia postoperatively for 1 month which resolved over the course of time within 3 months. At present, 6 months postoperative the patient is symptom-free and pain-free and claims to have quit his habits of alcoholism and smoking.

Histopathology confirmed the diagnosis of the bony mass as an osteoma.

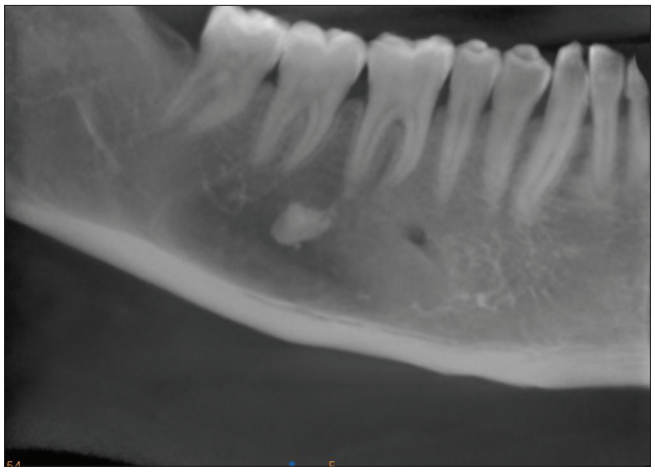

**Figure 1:** Preoperative orthopantomography

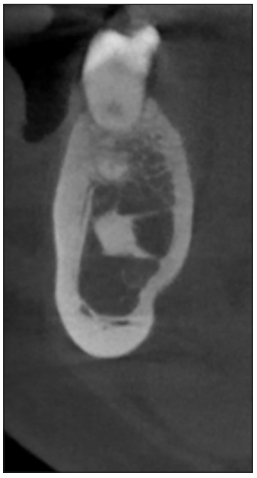

**Figure 2:** Sagittal section

**Figure 3:** Osteotomy cuts for access osteotomy

**Figure 4:** Preserving the mental nerve as it emerges from the foramen

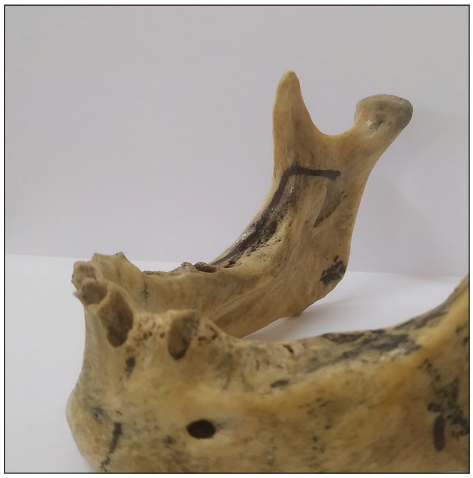

**Figure 5:** Osteotomy cuts

**Figure 6:** The inferior cut being a thorough and thorough cut involving both the cortices (Epker's Modification)

**Figure 7:** Preplating of the mandible

**Figure 8:** The osteoma specimen

## Discussion

Removal of endosteal osteoma is tricky due to its association with the IAN. The constant impingement of the osteoma over the nerve causes paraesthesia. Common techniques such as buccal corticotomy/osteotomy and extraoral access are used. Extraoral approaches result in scar formation and have the risk of injuring the marginal mandibular branch of the facial nerve.

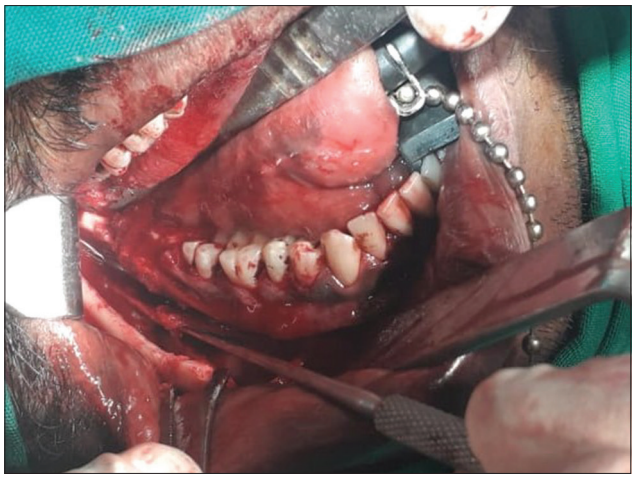

**Figure 9:** Inferior alveolar nerve preserved

SSO delivers the best result in terms of minimized comorbidity. Direct vision to the area of interest is obtained with the least comorbidity and least risk of avascular necrosis as the periosteum is never completely stripped off the bony segments.[12]

It also allows the freeing of the nerve away from the bone to relieve it of any bony impingements and allows the nerve to "rest" after the constant trauma it had been subjected to by the pathology.

The preplating of the mandible helps to preserve preexisting occlusion and to maintain the condyle in its true position thereby preventing temporomandibular joint dysfunction [Figure 10].

## Conclusion

Our modification of the SSO is a versatile technique to surgically access the central mandibular compartment with minimum comorbidity.

### Declaration of patient consent

The authors certify that they have obtained all appropriate consent forms. In the form, the patient has given written informed consent to publish clinical images and other clinical information pertaining to the case. The patient understands the name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

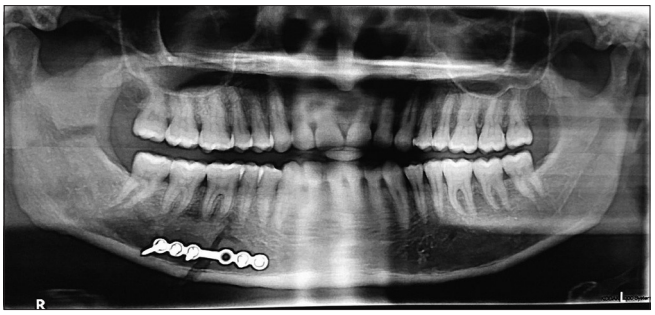

**Figure 10:** Postoperative orthopantomography

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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