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Mandibular Swing Approach via Paramedian Mandibulotomy for Surgical Access to an Inaccessible Tongue Lesion: A Case Report and Review of Literature

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Abstract

The surgical management of deeply situated oral cavity lesions is challenging, particularly when transoral access is limited by tumour location or restricted mouth opening. The paramedian mandibulotomy approach, first described by Roux in 1836 and refined over time, provides optimal exposure for lesions in the oral cavity, oropharynx, and parapharyngeal space while preserving mandibular function and neurovascular integrity. This case report describes a 52-year-old male with a non-healing tongue ulcer and restricted mouth opening, necessitating a lip-split paramedian mandibulotomy for tumour excision. The osteotomy, performed between the canine and first premolar, incorporated a step-design and pre-adapted miniplates to ensure precise anatomical realignment and stability. The technique facilitated en bloc resection with adequate margins and maintained occlusal function without complications. Compared to midline or lateral approaches, the paramedian mandibulotomy minimizes morbidity by preserving muscle function and reducing risks of malocclusion, osteoradionecrosis, and sensory deficits. Literature supports its efficacy in complex head and neck oncology, offering superior exposure for tumour resection while enabling simultaneous neck dissection access. This approach remains a reliable option for deep-seated lesions, particularly in patients with restricted mouth opening, balancing oncological safety with functional preservation. Preoperative planning, meticulous

osteotomy design, and plate pre-adaptation are critical to optimizing outcomes.

Keywords: mandibulotomy, access osteotomy, tumour, mandibular swing approach, oral cavity lesions

Case Report

Introduction

The surgical management of deeply situated oral cavity lesions poses considerable difficulties, particularly when standard transoral techniques prove inadequate due to tumour characteristics or patient-specific limitations such as restricted mouth opening.[1] To address these limitations, access osteotomy approaches have been developed which involve carefully planned osteotomy cuts to create a surgical window allowing improved exposure and greater visibility.

Paramedian mandibulotomy approach is a well-established surgical technique that provides wide exposure in difficult-to-access areas like the oral cavity, oropharynx, parapharyngeal space, and skull base. [2]

The mandibulotomy approach was initially introduced by Roux in 1836. Later, in 1959, Dubner and Spiro advanced the technique by incorporating a paralingual extension, laying the foundation for the modern mandibulotomy. [3] Over time, numerous modifications to this method have been documented.

The fundamental principle of the approach is to create a surgical corridor by dividing the mandible, allowing for retraction and direct visualization of deep-seated or posteriorly located lesions. [4]

Contemporary modifications of the mandibulotomy technique have been developed with the objectives of minimizing postoperative complications, preserving occlusal relationships, and maintaining optimal mandibular function. Among the various approaches described in the literature, the median and paramedian mandibulotomies are most frequently employed. The paramedian variant is typically performed between the canine and first premolar teeth, anterior to the mental foramen, to preserve neurovascular structures. Pre adaptation of the miniplates to the osteotomy segments facilitates precise anatomical realignment, mitigating risks of malocclusion and osseous non-union. [2]

Case Presentation

A 52-year-old male presented to the department of surgical oncology with a history of a non-healing ulcer on the left lateral border of tongue (2.5 × 2 cm) accompanied with limited mouth opening (10mm) since 6 months. The patient was a chronic tobacco chewer. No relevant medical comorbidities were reported. On general examination, the patient appeared moderately built and well-nourished. Conscious and oriented with respect to time and place.

Intraoral examination demonstrated a solitary, irregular ulcer measuring 2.5 × 2 cm on the left lateral border of the tongue, extending to the ventral surface. The ulcer exhibited raised, everted margins with a necrotic base and surrounding induration. Generalized oral submucous fibrosis was evident, characterized by blanching and palpable fibrotic bands in the buccal mucosa. No dental trauma or sharp edges were observed that could account for the ulceration. Incisional biopsy was a practically difficult choice due to its location. Hence, a lip-split paramedian mandibulotomy was planned to access the lesion.

Surgical Procedure

Under general anesthesia, following patient positioning and standard painting and draping, A midline lip-split incision was made from the vermilion border extending 1 cm below the menton, then curved laterally along a natural neck crease for potential neck dissection access. Subperiosteal dissection was done to expose the mandibular parasymphysis, with particular attention to

identifying and preserving the mental neurovascular bundle through careful soft tissue retraction. Two 4-hole with gap miniplates were pre-bent and adapted to the labial cortical plate of mandible where the osteotomy cuts were planned. The osteotomy was designed as a step configuration between 32 and 33, with the vertical component beginning distal to 32 extending from the alveolar crest to approximately 6-7 mm towards the inferior border of mandible, connected by a 5 mm horizontal component which connects to a vertical component extending to the inferior border, completing the osteotomy. (Fig. 1) Mandible was then swung around laterally and superiorly. (Fig. 2) Care was taken to elevate the lingual tissues sub-periosteally to favor reattachment. Upon achieving adequate surgical access, the lesion was excised with 1 cm of safe tissue margins. Mandible was repositioned and stabilized with the pre-adapted plates and fixed with six 2 × 6 mm screws. (Fig. 3) Wound closure was done in a layered manner. Post operative period was uneventful. Excised specimen was sent for histopathological examination.

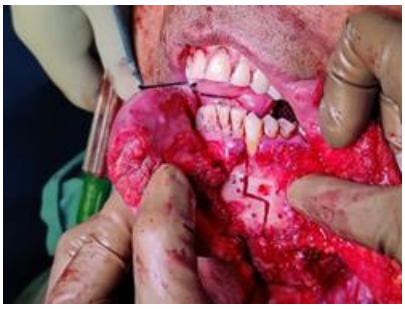

Figure 1: Paramedian Mandibulotomy cuts

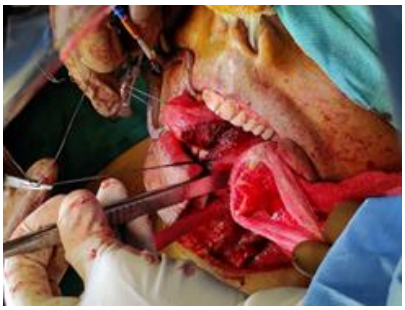

Figure 2: Mandible swung laterally and superiorly

Figure 3: Fixation of mandibulotomy site with miniplates

Discussion

The concept of access osteotomy has its origins in 1836 when Roux first described the technique to enhance surgical exposure. Over time, the procedure has undergone significant refinements, including the development of the trans-labial mandibular osteotomy approach by Attia and colleagues in 1984. [5] Paramedian mandibulotomy is a well-established surgical approach for accessing deep-seated or posteriorly located lesions of the oral cavity and oropharynx, especially in patients with restricted mouth opening, allowing for direct visualization and excision of tumors that are otherwise inaccessible via transoral or trans-pharyngeal routes. The paramedian site is preferred over midline or lateral osteotomies as it preserves the geniohyoid and genioglossus muscles, maintaining tongue mobility and minimizing functional morbidity. [6] It offers several advantages over midline and lateral mandibulotomies avoiding the denervation and devascularization risks associated with lateral approaches and the muscle division sequelae seen in midline osteotomies. [7]

Literature supports the use of paramedian mandibulotomy for lesions requiring wide exposure, such as advanced tongue cancers, parapharyngeal tumors, and recurrent or residual malignancies. Studies have demonstrated that this approach provides superior access to the lateral border of tongue and floor of mouth,

facilitates en bloc tumor resection, and allows for complex reconstructions. [8]

A review by Brown et al. highlights that paramedian mandibulotomy, when compared to midline and lateral approaches, offers a balance between surgical access and preservation of mandibular integrity, with lower rates of malocclusion and cosmetic deformity. Additionally, the risk of osteoradionecrosis is lower with paramedian straight osteotomies than with notched or lateral cuts, especially when postoperative radiotherapy is planned.[9]

Literature reviews emphasize that the choice of mandibular osteotomy site should consider tumor size, proximity to neurovascular structures, malignant potential, and vascularity to optimize oncological clearance while preserving function. [10]

Paramedian mandibulotomy offers dual advantages of maintaining mandibular continuity and enabling simultaneous neck-skull base access, establishing it as a preferred approach in complex head and neck oncology.

Conclusion

The paramedian mandibulotomy is a key technique for accessing deep oral/oropharyngeal tumors, especially in cases of limited mouth opening. It enhances surgical exposure, maintains mandibular continuity, and occlusal function and neurovascular integrity. Pre-adapting the plates and step-design osteotomy reduce risks, ensuring its reliability in complex oncologic resections while preserving functional outcomes.

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