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RESEARCH ARTICLE

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COLD SALINE IRRIGATION IN THIRD MOLAR SURGERY: A NOVEL APPROACH FOR ENHANCED HEALING AND REDUCED POSTOPERATIVE MORBIDITY

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ABSTRACT

This Surgical removal of impacted mandibular third molars is one of the most frequently performed oral surgical procedures. The term impaction originates from the Latin word impactus (meaning wedged). An impacted tooth is unable to erupt into functional occlusion and usually requires surgical removal to prevent complications. Among all teeth, mandibular third molars have the highest incidence of impaction, ranging from 16.7% to 68.6% [1]. Postoperative pain, swelling, trismus, and infection remain the most common complications after surgical extraction. Cold saline irrigation during osteotomy has been suggested to reduce thermal injury, minimize inflammation, and enhance healing. This article presents a case report of mandibular third molar removal using cold saline irrigation at 8°C, with favorable postoperative outcomes.

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INTRODUCTION

According to the World Health Organization (WHO), an impacted tooth is one that fails to erupt into its normal functional position due to obstruction by overlying soft tissue, bone, or adjacent teeth [7]. Third molar impaction is a common dental anomaly, with variable prevalence worldwide [3]. Extraction of impacted third molars is performed for relief of pain, prevention of caries and periodontal disease, management of cystic or neoplastic changes, and to facilitate orthodontic or orthognathic treatment [2,4] Postoperative complications such as alveolar osteitis, swelling, trismus, and infection are commonly reported [4]. Thermal damage to bone caused by drilling during osteotomy may contribute to delayed healing. Irrigation solutions are employed to minimize heat generation, improve visibility, and reduce the risk of bone necrosis. Normal saline is the most widely used irrigant; however, cold saline has shown potential in reducing postoperative morbidity by limiting inflammatory response and enhancing osteoblastic activity [5,6].

Etiology and Theories of Impaction: Third molar impaction is primarily caused by a discrepancy between tooth size and jaw size, leading to insufficient space for eruption [1,3]. Multiple theories have been proposed:

Phylogenetic theory – Evolutionary changes in diet and masticatory function have reduced jaw size, leaving inadequate space for third molars [8].

Mendelian theory – Hereditary transmission of large teeth and small jaws may predispose individuals to impaction [9].

Orthodontic theory – Normal jaw growth occurs downward and forward. Any disturbance, such as premature loss of primary teeth or trauma, may restrict eruption pathways [10].

Pathological theory – Chronic infections, cysts, odontogenic tumors, or scar tissue can obstruct eruption [11].

Endocrinal theory – Abnormal secretion of growth hormones can alter jaw size and tooth eruption patterns [12].

Other contributing factors include dense overlying bone, gingival fibromatosis, ankylosis, malocclusion, and systemic conditions such as rickets, anemia, and congenital disorders like cleidocranial dysostosis [11,12].

The order of frequency of impaction is as follows:

- Maxillary third molars

- Mandibular third molars
- Maxillary canines
- Mandibular premolars
- Mandibular canines
- Maxillary premolars
- Maxillary central and lateral incisors [3,9].

CASE REPORT

A 31-year-old female patient reported to the Department of Oral and Maxillofacial Surgery with a chief complaint of pain in the lower left posterior region. The pain was sudden in onset, sharp, shooting, and intermittent.



Fig. 1. OPG (Showing the mandibular left third molar) Clinical and radiographic examination

- Infection associated with the mandibular left third molar (tooth 38).
- Pederson's difficulty index: distoangular impaction, Class II, Position A.



Fig. 2. Extracted socket

Fig 3 Suture given



Fig. 4. Tooth 38

Surgical procedure

- Performed under local anesthesia using 2% lignocaine with 1:80,000 adrenaline.
- Inferior alveolar, lingual, and long buccal nerve blocks administered.
- Ward's incision placed, full-thickness mucoperiosteal flap elevated.
- Bone guttering performed with copious cold saline irrigation (8°C).
- Tooth removed with elevators.
- Irrigation with betadine and cold saline.
- Wound closed with two simple interrupted sutures.
- Standard postoperative medications prescribed.

Follow-up: The patient was reviewed after 7 days. Healing was satisfactory, with no signs of infection, pain, trismus, or swelling. Sutures were removed uneventfully.

DISCUSSION

Mandibular third molars are the most commonly impacted teeth due to inadequate jaw space, genetic factors, and evolutionary changes^[1,3]. Theories explaining impaction highlight the interplay of heredity, jaw growth disturbances, systemic conditions, and pathological obstructions^[8-12]. Complications after third molar surgery, such as alveolar osteitis, swelling, pain, and infection, significantly affect patients' quality of life^[4]. Irrigation plays a vital role in preventing thermal injury during bone cutting. Cold saline has been reported to:

Decrease inflammatory mediator release^[5]. Reduce pain and swelling^[6]. Enhance osteoblastic activity and promote bone healing^[5,6]. In the present case, irrigation with 8°C cold saline during osteotomy resulted in minimal postoperative morbidity, supporting earlier studies on its beneficial effects.

CONCLUSION

Surgical removal of impacted mandibular third molars is a routine oral surgery procedure with potential complications. Cold saline irrigation during osteotomy reduces thermal damage, minimizes postoperative pain and swelling, and enhances healing. Further controlled clinical studies are needed to validate its widespread use in oral surgery practice.

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