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Effect of collagen and hyaluronic acid on healing after impacted lower third molars surgical extraction.
(A clinical and radiographic study)

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Introduction:

Third molar surgery is one of the most commonly performed procedures in dentistry.[1] The post-operative complications such as pain, swelling, and trismus influence the patient's quality of life.[2] Therefore, it is important for the surgeon and patient to decrease the post-extraction complications and improve the third molar extraction socket healing by using a simple method.[3]

The results of some studies on intra-socket management with different materials have shown that inserting proper materials is more effective than allowing natural healing of the sockets.[4]

Several techniques and biomaterials have been described to reduce postoperative complications and stimulate the healing process after third molar extraction. Among these substances are type I collagen [5,6] and hyaluronic acid.[7-10]

This study will compare the effect of collagen application alone and combined with hyaluronic acid on healing after surgical extraction of impacted lower third molars.

Aim of the study:

Study of effect of collagen and hyaluronic acid on healing after impacted lower third molars surgical extraction, Will be studying:

1) Swelling.
2) Pain.
3) Mouth-opening.
4) Soft tissue healing.
5) Radial density.

Methods and Materials:

Study design

Randomized split-mouth controlled study

Randomization: coin flipping

Study Sample

This study will include 20 patients undergoing impacted bilateral lower third molars surgery under local anesthesia. Sample size (n = 40)

The two bilateral impacted molars were distributed by simple randomization (coin flipping) to first and second groups, so that one was surgically managed at the same day and that on the other side after more than 21 days.

One of the two impacted third molars was assigned to the first group (collagen will be applied just before suturing), other side to the second group (collagen and hyaluronic acid will be applied before suturing).

Place of study

Damascus University, Faculty of Dentistry

Oral and Maxillofacial Surgery Department

Inclusion criteria

1. The patient's age (18-35) years.
2. Surgical extraction of symmetrically impacted lower third molars is indicated.
3. Good general health and there are no uncontrolled systemic diseases.
4. The integrity of the periodontal tissues and the absence of periodontal diseases.
5. Good oral health.
6. There is no allergy or contraindication to the required postoperative prescription or to the applied medicinal substances.

Exclusion criteria

1. Pregnant
2. Diabetes mellitus
3. Hypertension
4. Compromised immune system or other systemic diseases
5. Patients with pericoronitis, infection, pathological condition in the region of surgery

The surgical procedure

After local anesthesia with 2% lidocaine + 1:80,000 epinephrine solution, Triangle full thickness flap will be reflected and necessary bone will be removed by slow speed straight surgical headpiece with continuous irrigation of saline solution. After the impacted molar will be removed and the socket will be well rinsed with saline.

In the first group collagen will be applied in the extraction socket.

In the second group collagen and hyaluronic acid will be applied in the extraction socket. The extraction wound will be sutured with silks.

After every surgery, patients will be received fixed postoperative instructions.

Post-surgical prescription

Amoxicillin: 1 g twice daily for the 7 postsurgical days.

Paracetamol 500 mg: as necessary.

Clinical and radiographic follow-up

radiographic follow-up

Periapical digital radiographs will be taken:

- Before the surgery
- 1 month after the third molar extractions.
- 3 month after the third molar extractions
- 6 month after the third molar extractions

The ImageJ image analytics program will be used to measure changes in the bone density of the extraction socket site.

Clinical follow-up

Confirmed study participants were screened for assessment swelling measurements and mouth opening before surgery(T0). post-operative clinical assessments will be performed at third day (T1), 1 week(T2).

1- The swelling

Facial swelling will be evaluated by the method which measures 3 distances:

- from the tragus to oral commissure
- from the tragus to pogonion.
- from outer angle of eye to angle of mandible.

2- Mouth opening

Maximum mouth opening will be measured as the maximum distance between the maxillary and mandibular central incisors.

3- The pain

Postsurgical pain will be evaluated using visual analogue scale (VAS) of faces 7 days after extraction.

4- Soft tissue healing

Soft tissue healing will be assessed at the seventh postoperative day through gingival healing index given by Landry et al.

Data Analysis

Data will be analyzed using SPSS version 25 software

❖ The Kolmogorov-Smirnov test will be performed to study the normal distribution of the values of each of the measured parametric variables(radial bone density…). T-test will be used for correlated samples for comparison of time periods in each group

❖ If the distribution of the values is abnormal, then the Mann - Whitney U test will be used to compare the two groups, and the Wilcoxon test for the algebraic ranks will be used for the double comparison between the time periods in each group

❖ For the nominal variables (the degree of pain, …), the Mann-Whitney U test will be used to compare the two groups, and the Wilcoxon test for algebraic signs will be used to compare the time periods in each group as well.

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