

Effective treatment of post-traumatic fracture defects of the lower jaw in the alveolar process.

Kholigov Azizbek Alimurodovich¹, Yuldashev Abduazim Abduvalievich², Fattayeva Dilorom Rustamovna², Alimzhanov Kamronbek Zhasurjanovich², Khudoykulov Akbarali Saidovich³

1 Samarkand State Medical Institute, Republic of Uzbekistan

2 Toshkent State Dentistry Institute, Republic of Uzbekistan

3 № 7- clinical hospital of the city of Tashkent Republic of Uzbekistan

azizbekkholiqov1985@gmail.com

Abstract: In the projection of the fracture line, pronounced bone beams were visualized, localized mainly in the central parts of the bone. The degree and severity of neo-osteogenesis in this period of observation were more pronounced in patients of the main group, in which bone defects were filled with osteoplastic material. Complete restoration of CT in the area of the fracture, according to the X-ray examination, was noted in the main group 1-3-6 months after surgery. In the comparison group, similar results were observed after 7-12 months. Here is a clinical observation

Keywords: lower jaw, osteosynthesis, osteoplastic materials, osseointegration.

Introduction

Today, the problem of surgical treatment of patients with fractures within the dentition remains relevant. This is due to a slowdown in bone tissue regeneration (CT), the possibility of the development of purulent-inflammatory complications in the area of the extraction socket [1,9]. The use of modern methods of osteosynthesis does not always provide good results. Rehabilitation of patients remains incomplete, which contributes to a decrease in their ability to work and quality of life [1]. In everyday practice, oral and maxillofacial surgeons and dental surgeons use a wide range of medications to replace bone defects.

It has been established that the rate of QD recovery at the site of the defect depends on the properties of the osteotropic material used in this case, mainly, on its ability to stimulate the formation of QD and the processes of its rapid mineralization

[2]. Currently, synthetic substitutes for CT are an alternative to biological material. There are certain requirements for implants used in dentistry and maxillofacial surgery: osteoinduction, porosity, ability to absorb and create a framework for CT ingrowth [3].

Good results can be obtained when filling cavities with preparations with a collagen base, and their effectiveness is quite high, and the range of application in maxillofacial surgery is very wide [4,5,6,8]. One of these drugs is osteoplastic material. It is a porous material containing type 1 native collagen obtained from the skin of cattle. The implant is produced in the form of membranes, tourniquets, balls, powder. When placed in a wound, the osteoplastic material accelerates the migration of fibroblasts to this area, their integration into the implant[10,11,]. A transitional matrix is created, which stimulates the body's immune system and the activation of granulocytes, macrophages, improves the transfer of growth factors released from cells, which leads to increased migration of fibroblasts and proliferation of epithelial cells[3,5,7,9]. The aim of our study was to increase the effectiveness of treatment of patients with fractures of the mandible within the dentition based on the use of osteoplastic material.

Materials and methods

On the basis of the clinic of maxillofacial surgery of the 7 city clinical hospital of the city of Tashkent, 34 patients (30 (85.4%) male 4 women) were under observation for one year. According to the results of radiation examination, all patients showed satisfactory fixation of the fragments. Osteoplastic material X-ray criteria for the effectiveness of osseointegration in patients of both groups after 1 month were the initial signs of callus formation in the area of impaired bone integrity in the form of single newly formed bone trabeculae. Significant differences in the rates of regeneration in both groups of patients 3 months after the operation, clearer radiological signs of bone regeneration were revealed.

In the projection of the fracture line, pronounced bone beams were visualized, localized mainly in the central parts of the bone. The degree and severity of neo-osteogenesis in this period of observation were more pronounced in patients of the main group, in which bone defects were filled with osteoplastic material. Complete restoration of CT in the area of the fracture, according to the X-ray examination, was noted in the main group 1-3-6 months after surgery. In the comparison group, similar results were observed after 7-12 months. Here is a clinical observation.

Clinical observation Patient A., 28 years old, was admitted to the clinic of maxillofacial surgery of the 7th city clinical hospital of the city of Tashkent on an emergency basis with complaints of pain in the mandible, restriction of mouth opening, malocclusion. On examination: the configuration of the face was changed

due to edema of the soft tissues of the parotid-chewing and buccal regions on the left and the submandibular region on the right. No changes in the skin, their turgor were found. There was pain on palpation in the area of the body of the lower jaw and the temporomandibular joint on the left, a positive symptom of direct and indirect loading. There were no difficulties or pain when swallowing. Regional lymph nodes were not palpable. There was a restriction of opening the mouth to 2 cm due to severe pain. From the side of the oral cavity: revealed a rupture and edema of the mucous membrane in the area of the tooth Revealed pathological mobility - horizontal and vertical fragments of the lower jaw in the area of the body on the right. There was a violation of the bite. According to orthopantomography, the violation of the integrity of the bone tissue of the lower jaw in the area of tooth 4.8 and the condylar process on the left was determined.

On admission, the patient underwent double-maxillary splinting with individual splints with hook loops, the bite was fixed with rubber rods.

The diagnosis was made: bilateral fracture of the lower jaw - open in the area of tooth 4.8 and closed in the area of the condylar process on the left with a displacement.

Under conditions of endotracheal anesthesia (nasotracheal intubation), the patient underwent surgery for 7 (14.6%) women) with fractures of the mandible within the dentition. All fractures were diagnosed within the dentition of the lower jaw: in 30 (62.5%) patients, the fracture line passed through the socket of the third molar, in 15 (31.3%) - in the area of premolars and first molars, in 3 (6.2%) patients - in the area of the frontal group of teeth. A single fracture of the lower jaw with displacement was noted in 20 (41.7%) cases, double - in 21 (43.8%) patients, bilateral - in 7 (14.5%) patients. After the standard volume of studies, which included radiation diagnostic methods (orthopantomography and computed tomography), all patients underwent surgery. X-ray examination was performed according to the standard technique. Dynamic radiation observation was performed to monitor the effectiveness of the treatment performed at 0 (after the application of dental splints), 1, 3, and 6 months after injury. The complex of treatment included antibacterial, anti-inflammatory, analgesic therapy (cefazolin 1.0 3 times a day intramuscularly (i / m) or lincomycin 900 mg 2 times a day i / m, suprastin 1 tablet 2 times a day, ketonal 1.0 for pain in / m). The patients were divided into 2 clinical groups: in the main group - 24 (50%) observations for filling the bone defect that occurs after tooth extraction in the fracture area, bone grafting material was used, in the comparison group - 24 (50%) observations after surgery, the holes were healed under the muco-periosteal flap.

Operation technique

1st stage. An incision is made from the side of the vestibule along the transitional fold of the mucous membrane in the projection of the teeth 4.5-4.8 / 3.5-3.8. Skeletonize the bone. The fracture line is visualized in the area of the tooth 4.8 / 3.8. The tooth is removed 4.8 / 3.8. The fragments are repositioned in the correct position, fixed using extra-bone or intraosseous structures under the control of the bite. The resulting bone cavity in the area of the extracted tooth 4.8 / 3.8 and the fracture line are filled with mixed with 2 ml. blood (taken from the patient's cubital vein) 0.7 g of "OsteonTM II Collagen" and 2-3 balls of "OsteonTM II Collagen" material, depending on the volume of the defect. The wound is sutured from the side of the oral cavity with separate interrupted Prolen 4.0 sutures. Aseptic pressure bandage on the area of the lower jaw in the operation area.

Results and discussion

On admission on an emergency basis, all patients underwent fixation of dental splints with hook loops. Patients of the main group underwent an operation to remove teeth from the fracture line (except for impacted and dystopic ones), followed by reposition of fragments and metal osteosynthesis using titanium mini-plates (17 cases - 70.8%) or brackets made of titanium nickelide (7 cases - 29.2%) and replacement of bone defects with "OsteonTM II Collagen" material. In 12 (50.0%) patients the powder diluted in autologous blood was used, in 6 (25.0%) - tourniquets, in 6 (25.0%) - 2-3 balls. Patients of the comparison group underwent a similar operation, but without implantation of osteoplastic material: in 16 (33.3%) cases, titanium mini-plates were used to fix the fragments (1 or 2, depending on the fracture area and its multiplicity), in 8 (17.7%) % of patients - brackets made of titanium nickelide (the shape and number also depended on the location of the fracture). In patients of both groups, the postoperative period was uneventful. The sutures were removed on days 9-10. the proposed technique: tooth extraction 4.8.

Metal osteosynthesis of the lower jaw was performed in the area of the angle of the lower jaw on the right and the condylar process on the left with 2 titanium mini-plates and mini-screws. The bone defect is filled with "OsteonTM II Collagen" material (block). The postoperative period was uneventful. A course of antibacterial, anti-inflammatory, analgesic therapy was carried out. Performed daily dressings with treatment of wounds with solutions of antiseptics, change of rubber rods on the 3-5th day. The sutures were removed in the submandibular region on the left on the 7th day after the operation, from the side of the oral cavity - on the 10th. The tires with hook loops were removed on the 10th day after the operation. As a result of the treatment, the bite usual for the patient was restored. No phenomena of neuropathy of the inferior lunar nerve were found. Edema of soft tissues in the area of surgery was moderate and regressed within 7 days. The control X-ray showed the residual bone

cavity in the area of the extracted tooth, satisfactory fixation of the bone fragments. According to the control orthopantomography performed 3 months after surgery, there were pronounced signs of osteogenesis and bone regeneration. The treatment of patients with a fracture of the mandible within the dentition showed an improvement in the results in the group with the elimination of bone defects after tooth extraction and filling the fracture line with "OsteonTM II Collagen" material: the time of regeneration of the mandible bone decreased from 7-6 months to 4-5 months. An analysis of the results of X-ray studies showed that the features of 's rearrangement depend on the localization of the fracture line, the volume of the bone defect, the shape of the material .

In areas of impaired integrity of the bone tissue (in the area of the angle of the lower jaw on the right and the base of the condylar process on the left), initial radiological signs of bone regeneration are noted. The transparency in the area of the fracture lines is reduced, single bone trabeculae are visualized, and X-ray signs of partial restoration of the damaged cortical plate are determined. The violation of the integrity of the bone tissue of the alveolar part of the lower jaw in the area of tooth 4.8 is determined, the comparison of the fragments is satisfactory. Also, a fracture line is visualized at the base of the condylar process on the left with its slight displacement. Orthopantomogram of the patient 1 day after surgery.

Condition after extraction of tooth 4.8 and metal osteosynthesis of the lower jaw in the area of the corner on the right and the condylar process on the left. Condition bone fragments are satisfactory. There is a bone defect in the area of the extracted tooth 4.8. Osteoplastic material in this zone is not visualized. There are radiological signs of bone regeneration in the area of fractures of the lower jaw - the fracture lines are significantly narrowed, against their background, pronounced bone beams are determined, the cortical plates of the jaws in these zones are practically restored. CT scan defect, previously corresponding to the area of the extracted tooth and the introduced osteoplastic material is not visualized in this study. Various forms of material in order to completely eliminate the formed cavity and accelerate osteoregeneration process.

Conclusion

The obtained results of surgical treatment of the patients with fractures of the lower jaw with a fracture in the plane indicate that after tooth extraction, it is advisable to fill the sockets with osteoplastic material. The use of this drug allows to reduce the time of bone formation and rehabilitation of patients in general. In addition, the use of osteoplastic material avoids complications associated with the development of the "empty hole" syndrome.

References.

1. Andreasen J. O., Andreasen F. M., Andersson L. Textbook and Color Atlas of Traumatic Injuries to the Teeth. – 4-th Ed. – Oxford, 2007.
2. Ardary WC. / Plate and screw fixation in the management of mandible fractures. // Clin Plast Surg. -1989. -16: - P. 61-67.
3. Rubin M. M., Koll T. J., Sadoff R. S. // J. Oral Maxillofac. Surg. – 1990. – Vol. 48. – P. 1045–1047.
4. Baker S, Betts N J. Mandibular angle fractures. In: Abubaker AO, Strauss RA, eds.// Oral and Maxillofacial Surgery Update - Trauma. Rosemont, IL: //American Association of Oral and Maxillofacial Surgeons. -1998. -2. - p. 11-27.
5. Grigor 'yants L.A., Sirak S.V., Fedurchenko A.V The use of modern osteoplastic materials for the plastics of the jaw bone defects. Paper. Moscow: Meditsina; 2006 (in Russian).
6. Ivanov S.Yu., LarionovE.V., Panin A.M., Kravets VM. et al. Development of collagen-based biomaterials for bone osteoplasty. Institute of Dentistry. 2005; 4: 1-3 (in Russian).
7. Mazharenko T.G. Clinical and experimental justifi cation of the choice of osteoplastic funds in surgical treatment of odontogenic cysts of jaws: Diss. M.; 2007.
8. Kato T. Single local injection of recombinant fibroblast growth factor-2 stimulates healing of segmental bonedefects in rabbits / T. Kato, H. Kawpjuchi, K. Hanada et al. // J. Orthop. Res. — 1998. — Vol. 16. — P.654-659.
9. Taylor J.C., Cuff S.E., Leger J.P., Morra A., Anderson G.I. In vitro osteoclast resorption of bone substitute biomaterials used for implant site augmentation: a pilot study. Int J. Oral Maxillofac. Implants. 2002; 17 (3): 321–30.
10. Joyce ME. Transforming growth factor-beta in the regulation of the repair /M.E. Joyce, S. Jingushi, M.E. Hollander // Orthop. Clin. North. Am. — 1990.— Vol.21. — P. 199-209.
11. Kato T. Single local injection of recombinant fibroblast growth factor-2 stimulates healing of segmental bonedefects in rabbits / T. Kato, H. Kawpjuchi, K. Hanada et al. // J. Orthop. Res. — 1998. — Vol. 16. — P.654-659.