schema: under the local anaesthesia Novocaine 0,25% - 5-7 ml, we have cut animals back hair on the area of 5,0 x 5,0 cm. The operation field was treated with an antiseptic (solution spirituous tincture of iodine). We have done two incisions of 3,5 cm. length of the parallel of vertebral spinal skin and subcutaneous fibrous tissue. The subcutaneous fibrous tissue was separated from the muscular fascia. The culture of variety field of St. aureus (in concentration 1:500 and 1:1000) was leaded into the wound. On the wound it was put postpone knot stitches with an atraumatic suture material (vicrilum - 5 - 0). The animals were assessed at 24, 48 hours, 3, 7, an 14 day, and followed up 3 and 6 months postoperatively.

Results

of experimental studies had demonstrated development of purulent-inflammatory process in 100% of cases.

Conclusions

All mentioned above gives to make conclusion that described method of making experimental model for studying effectiveness of treatment and prophylaxis procedures on the beginning and development of purulent-inflammatory process is simple to be reproduced, it does not demand a lot money. That is why it is to be recommended for large use in medico-biological investigations.

METHODS OF EXPERIMENTAL MODELS MAKING TO STUDY STIMULATION OF REGENERATION PROCESS OF MANDIBLE BONE TISSUE

I.O. Pohodenko-Chudakova

Bellorussian State Medical University
Pushkina av. 33 - 239, 220092 Minsk, Belarus

[Engineering of Biomaterials, 37, (2004), 11-12]

Traumatic fractures of mandible is one of actual problem in cranio-maxillofacial surgery. Increasing number of maxillofacial injures is involving rise of traumatic fractures of mandible last years, which is varying from 67,4% to 85% [...]. It is well known frequency of adult people dental anomaly makes from 33,6% to 63%. That fact bring grate interest of specialists to look for new and more effective methods of treatment and surgical procedures of mentioned above diseases. It requires making of new experimental models to study stimulation of regeneration presses of mandible bone tissue.

Aim of research

is to elaborate new experimental models for studying stimulation of regeneration processes of mandible bone tissue which meet the following requirements: 1) operation procedures are to be done painless; 2) experimental animal is to be kept alive postoperatively with good function of dental activity.

Materials and methods

Experiment was performed on 24 dogs of the same weight and age. Operation has been done under intravenous anesthesia with Sol. Thiopentali-Natrium 10%, 40 - 45 mg per 1 kg of animal weight. Using of that anesthesia treatment has permitted to make operations on mandible within 1,5 - 2 hours without additional anesthesia. They have used approximately 15 ml of Sol. Thiopentali-Natrium 10% while one operation procedure. That method gives to avoid complications as during operation procedures as well after it.

Operations have been performed in aseptic conditions.

FIG. 1a) skeletized part of the horizontal section of animal mandible.

FIG. 1b) osteotomic cut of the horizontal section of animal mandible.

Episodes of operation procedures are shown on the FIG.1. Incision has been made parallel in 1 sm to the edge of mandible. Skeen was cut till the bone. After the periosteotomy and skeletization of horizontal part of mandible made by SIEMENS stomatologic equipment, osteotomy has been performed under the angle of 80 - 90in the region of 5-6th tooths. Nerves and capillary have stayed undamaged as it is shown in the FIG.2. Tooths of osteotomical region have been extracted. After the operation the wound was cultivated with 5 ml of Sol. Lincomicini 30%. Layer by layer, they have put stitches in a wound by superamide. Stitches were cultivated by Sol. Iodi Spirituosae 5%. Than the same operation has been made on the opposite site of animal mandible. Postoperatively, all animals had antibacterial and anti-inflammatory treatment course of 7 days. Animals were treated by Sol. Lincomicini 30% - 1 ml, Sol. Analgini 50% - 2 ml. once per day intramusculary.

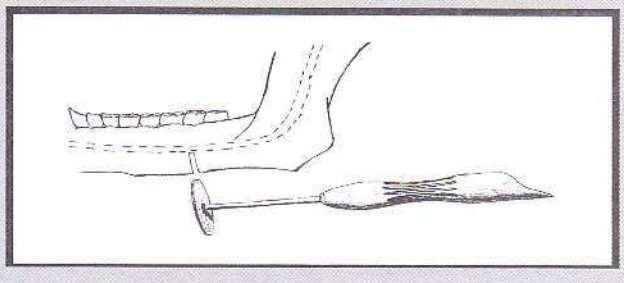

FIG. 2. Schema of osteotomical cut for experimental model of mandible trauma.

In order to take samples for histological examination, animals were subjected into intravenous anesthesia. Samples have been taken 7, 14, 21 days and 1,2 months later. Earlier damaged bone of mandible was sawn for samples. It was a piece of bone with 4 sm of width, 2 sm lengh from line of cut to each side. This hollowness has been filled with active materials of "biossetal" [O.P.Chudakov, A.M.Grehukha, A.Z.Barmutskaya et all, 2002]. They have put stiches in a wound slit by slit. After the experiment has been finished, samples have been put into the Sol. Farmalini 10%. Decalcinated by HNO_3, they have been placed into alcohol and put into paraffin finaly. Misroscopic sections have been painted according to the methods of Van-Guison and put into balm. Histological preparations have been made for latest examination in details and studying with light microscope.

Conclusion

Described above methods of making of experimental models to study processes of bone tissue regeneration of mandible are different from old ones. It allows to keep animals alive, there maxillofacial system stays in normal conditions. In some times these animals could be used for new experiments.

APPLICATION OF THE NEW BONE-REPLACING MATERIAL "KAFAM" IN STOMATOLOGY

T.M. Ulyanova , L.V. Titova*, S.V.v Medichenko , O.P. Chudakov **, L.G. Bykadorova**, V.L. Evtukhov**, T.B. Lyudchik **

*Institute of General and Inorganic Chemistry of NAS of Belarus, Minsk, E-mail: ulya@igic.bas-net.by
**Belarusian State Medical University, 83 Dzerzhinsky Ave., Minsk, Belarus

[Engineering of Biomaterials, 37, (2004), 12-13]

Treatment of the patients suffering from chronic periapical destructive processes, chronic complex periodontitis, benigh formations of the maxillae and other diseases of facial bones is the important and urgent problem of maxillofacial surgery since the above-mentioned diseases are very often encountered in the practice of physician-dentists. According to the WHO data obtained from examining the population of 53 countries the prevalence of periodontitis diseases attains 98% [1]. Among the grown-up population of the Republic of Belarus is practically the

100% morbidity of gingivity, simple and complex periodontitises [2, 3]. The results of the last two decades are evident of the fact that chronic apical periodontises are 30% and benigh tumors and cysts are no less than 45% of the total number of surgical maxilla diseases. In the majority of cases the immediate and distant results on the treatment of patients with such affections remain unsatisfactory [4]. At the same time in the USA, Germany, Great Britain, Switzerland, Japan and in other countries new osteoplastic materials are actively used for treating the above diseases. These materials promote recovering bone tissue, enable one to stop destructing the tooth root and to stimulate the processes of purposeful regeneration and reconstruction of the tissues of living organism. Calcium phosphate materials [5] are used in modern maxillofacial surgery. In Russia bone defects are filled with home-produced synthetic hydroxyapatite-based materials: "Ostim-100", "Gapkol", "Kolapol", "Kollapan", etc. [6].

In the Republic of Belarus the co-workers at the Institute of General and Inorganic Chemistry of the NAS of Belarus and at the Maxillofacial Surgery Chair of the Belarusian State Medical University are also carrying out investigations on creating osteoplastic materials. Unlike the Russian identical materials, Belarusian porous ceramics "Kafam" is stable in shape. When mixed with the blood in the operative wound, it makes a porous structure needed for a further purposeful growth of the cells of the newly formed bone tissue.

The chemical composition and structure of the developed material are adequate to those of the mineral part of the human bone. The calcium-to- phosphorus ratio is within 1.67-1.70 and corresponds to the one in the human native bone. This material can be sterilized many times, not losing its properties and can be used in combination with different-type antibiotics and antiseptics. The application of "Kafam" in medical practice does not require special instrumentation and equipment. It is produced in different shapes (blocks, plates, granules from 0.1 to 1.2 mm) in four types A, B, C and D that differ by heat treatment temperature and strength. All-type materials are used for surgical treatment of different stomatological diseases [7]. This material underwent technical, sanitary-hygienic, biomedical and clinical tests. Its use in stomatological practice was supported by the permission of the Ministry of Health of Belarus IM. 7. 3743 of March 20, 2003.

In planning the surgical intervention it is necessary to choose a required shape of "Kafam" - blocks, plates or granules. The size and shape of the implant material are chosen individually for every patient depending on the size and the shape of the bone defect. To illustrate the application of the material "Kafam" in stomatological surgery, two methods are presented below.

Procedures of filling the operative bone defects after radicular cysts are removed (Fig. 1). Prior to the operation the calcium phosphate ceramics "Kafam" undergoes sterilization together with operative instruments. A patient is tested on the sensitivity to a used antibiotic. The radicular cyst is removed using the traditional surgical methods. The formed bone defect is instilled with an aqueous 0.05% chlorhexidine solution and then with a 30% dichloride lyncomicine solution (FIG. 1a). The defect cavity is loosely filled with "Kafam" granules (type A, 0.5-0.6 mm in size) with a surgical spoon (FIG.1b). Having been instilled with the blood the granules form a blood clot with the material introduced (FIG. 1c). A mucoperiosteal graft is returned to its place and is fixed with separate interrupted sutures (FIG. 1d). Sutures are removed after 6-7 days. A patient is then under dynamic observation.

Procedures of treating periodontitis (FIG. 2). After the granulation tissue and tooth deposits are removed, the tooth roots are polished and also the alveolar bone border and the inner surface of the mucoperiosteal graft are treated. The wound is treated with an aqueous 0.05% chlorhexidine solution. If a patient is very sensitive to antibiotics, then the instillation with a 30% dichloride lyncomicine solution is not made. After the operative wound has been visually examined and the sizes of the marginal periodontium defect have been determined, the "Kafam" plate (type C) of the corre-