

Osteogenesis and Its Stimulation During Surgical Treatment of Odontogenic Cysts of the Jaw

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Abstract

The present work was aimed to elaborate optimal approaches of treatment stimulating osteogenesis in patients with odontogenic cysts subjected to cystectomy, and thereby enlarge the number of indications of cystectomy and osteostimulation of bony defects that have been left after operation. With this purpose, paste-like mixture of vitamin D₃ (cholecalciferol) and sterile powder of egg's shell have been suggested. Experiments have been carried out on rats and patients with odontogenic cysts using the general morphological investigation, immunohistochemistry and cytophotometry: In all cases of surgical treatment of odontogenic cysts, the good functional effects, without complications and recurrences have been achieved. Two to three months later with the use of X-ray control, reduction tendency in cysts' cavities was detected. Process of osteogenesis was accelerated markedly. Usually, if it takes one to three years, in our case mentioned period was approximately reduced to six month. Has been stated that suggested drug reveals stimulating effect activating the processes of regeneration.

Keywords: *vitamin D3, cholecalciferol, powder of egg's shell, odontogenic cyst, cystectomy, osteostimulation*

Introduction

Among diseases of maxillofacial area, odontogenic cysts of the jaw: radicular or rooty and coronary or follicular, belong to widely spread pathology. A treatment measure of the mentioned pathology is surgical. According to indications, cystotomy or cystectomy is used. From these two methods more radical and acceptable for patients is cystectomy, however this method is not always available because of the contact with a live teeth and in case of cyst's large size.

We were aimed to enlarge the number of indications of cystectomy and osteostimulation of bony defects that have been left after operation. The vitamin D₃ (cholecalciferol) and sterile powder of egg's shell were used for osteostimulation. Nowadays, the stimulation of osteogenesis is quite topical in modern medicine.

In the last years the most frequently used surgical method for odontogenic cysts treatment is the

cystectomy. The mentioned surgical manipulation includes complete removal of cyst's capsule and wound's suturation.

Restoration of defect that has been left after operation proceeds very slowly and it takes for about 1 to 3 years and sometimes more. Therefore, various methods and remedy promoting stimulation of osteogenesis have been worked out and suggested, however, mentioned therapeutic remedies have various contraindications for intake and usage.

Consequently, we have used vitamin D₃ (cholecalciferol), actively taking part in Ca and P ions metabolism, and very cheap and available product for patients, and at the same time highly active stimulator of osteogenesis - sterile and dispersive powder of egg's shell. Its composition exactly coincides with human's bones and teeth composition.

After X-ray examination, confirming the odontogenic cyst diagnosis, the electroodontodiagnostics of teeth in cystic cavity was performed. With the use of

Guttapercha's sticks, only "causative" and dead teeth were filled. Under the magnifier and on the background of local and regional anesthesia, in the region of cyst's location, producing section, mucosal periodontal flap was disconnected using the drill.

With the use of drill, after opening of cyst's anterior wall, the cystic capsule is removed completely. Bone defects are washed using the antiseptic solution. Thereafter, on the walls of bony cavity, ex tempore prepared paste-like mixture of vitamin D₃ and sterile powder of egg's shell is applied. The wound is sutured with catgut using the interrupted suture.

Material and Methods

Experiments have been carried out on rats. Using the drill, on the background of local anesthesia, in thighbone the bone defect (2x2 cm) was created artificially. For stimulation of osteogenesis in the one group of experimental animals the Hydroxylapatite, and in the second group - mixture of the vitamin D₃ and egg's shell sterile powder were used.

Morphological investigations with different intervals were performed in the following manner: general morphological investigation, immunohistochemistry and cytophotometry

Results

According to received data has been stated that the drug suggested by us is characterized by stimulating effect activating the processes of regeneration.

References

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Clinical investigations have been carried out on patients with odontogenic cysts. A total of 36 patients (21 women and 15 men, aged 18 to 60 years) were enrolled in investigations.

All patients underwent cystectomy. X-ray examination of clinical material was performed before and after operation.

In all cases of surgical treatment of odontogenic cysts the good functional effects, without complications and recurrences have been achieved. The wounds were healed by first intention.

2 to 3 months later, with the use of X-ray control, reduction tendency in cysts' cavities was detected. Process of osteogenesis was accelerated markedly. Usually, if it takes 1 to 3 years, in our case mentioned period was approximately reduced to 6 month.

Conclusion

According to received data and proceeding from the above discussed, it could be concluded that for restoration of bony defects being left after surgical treatment of odontogenic cysts, the paste-like mixture of vitamin D₃ (cholecalciferol) and sterile powder of egg's shell could be used successfully. Consequently, the above-mentioned surgical intervention in case of odontogenic cysts is absolutely justified.

Остеогенез и остеостимуляция при лечении одонтогенических кист челюсти

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Р Е З Ю М Е

Одной из важных проблем современной хирургической стоматологии является заполнение дефектов костной ткани, образующихся при хирургическом лечении ряда заболеваний и повреждений кости. Различные биологические и синтетические материалы, применяемые для замещения дефектов костной ткани в настоящее время не отвечают в полной мере требованиям хирургов. 36 больных с одонтогенической радикулярной кистой челюсти находились под наблюдением авторов. По показаниям, всем пациентам провели операцию - цистэктомию. С целью сохранения статики зубов сохранены корни, расположенные в полости кисты. Эту полость заполняли смесью порошка яичной скорлупы и витамина D₃ для стимулирования остеогенеза на участке послеоперационного костного дефекта. Химический состав яичной скорлупы идентичен химическому составу человеческих костей и зубов, а витамин D₃ стимулирует обмен ионов Са и Р. Раны во всех случаях зажили первичным натяжением. После 2-3 месяцев, при рентгенологическом контроле отмечалась отчетливая тенденция к уменьшению кистозной полости.

Ключевые слова: *колекальциферол, стерильный порошок яичной скорлупы, одонтогенная киста, цистэктомия*