

Conference paper

## Mandibular TiNi-based Endograft in Patients with Toxic Jaw Osteonecrosis and Drug Abuse

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### Abstract

Osteonecrosis of facial skull among addicts to synthetics drugs (desomorphine, pervitin) lead to deformation of the face and defects of the jaw due to multiple sequestrations or expanded necrectomies. Reconstruction of jaw continuity in jaw defects is highly demanding procedure due to high risk of osteonecrosis relapse, poor compliance among drug addicts.

### 1 Experimental

From 2007 to 2015 190 addicts to synthetic drugs with jaw osteonecrosis were supervised and treated in our department. Main group consisted of 22 patients who were treated with primary or secondary jaw reconstruction after jaw resection due to toxic jaw osteonecrosis. Aims. Classify reconstruction methods of jaw continuity in addicts to synthetic drugs.

### 2 Results and discussion

Toxic jaw osteonecrosis is a common disease among addicts to synthetic drugs – desomorphine and pervitine, ‘cooked’ from codeine pills, iodine and red phosphorus, which is scraped from match boxes. Clinical signs, roengenological data, anamnesis of intravenous usage of synthetic drugs, containing phosphorus and its compounds resembles phosphorus jaw osteonecrosis ‘phossy jaw’, and more modern disease – medication-related jaw osteonecrosis. The aim of this study is to classify reconstruction methods of jaw continuity in addicts to synthetic drugs with toxic jaw osteonecrosis.

From 2007 to 2015 190 addicts to synthetic drugs with jaw osteonecrosis were supervised and treated maxillofacial department in First MSMU. Main group consisted of 22 patients who were treated with primary or secondary jaw reconstruction after jaw resection due to toxic jaw osteonecrosis. All patient had anamnesis of IV injections of different drugs and combination with desomorphine or pervitine from 2 month to 10 years. On admission all patients underwent standard analysis, roentgenological and microbiological examination.

On clinical examination all patients had denuded areas of bone that persisted for more than 8 weeks after tooth extraction, purulent discharge with ichorous smell, no sign of granulation tissue or areas of osteoporotic (softening) of the bone, no signs of demarcation or increased duration of sequestrum formation, pathological jaw fractures, massive periosteal accumulation of newly formed bone. All patients were classified as stage III, according to American Association of Oral and Maxillofacial surgeons [7], and were treated with extensive surgical treatment that was acknowledged by conservative or classical surgical therapy failure directed to perform sequestrectomy (Figure 1-7). Indications for surgery were following: persistent pain syndrome, exposed bone, purulent discharge, pathologic fractures and extraoral fistulas.

In main group of this study 22 patients received 25 endoprosthesis: in 5 cases primary jaw reconstruction with custom nickelid titanium plate and nickelid titanium tissue, 2 cases - segmental mandibular resection with primary reconstruction utilizing titanium bar, combination with nickelid titanium tissue (1 case). In 1 case titanium bar was replaced with nickelid titanium plate and nickelid titanium tissue. 20 cases were secondary reconstructed after 8-12 month from jaw resection in absence of new zones of osteonecrosis, purulent discharge, confi rejection of drug abuse. In 19 cases nickelid titanium plate and nickelid titanium tissue was used, in 1 case - titanium bar and nickelid titanium tissue. Endoprosthesis fi tion was carried out with shape memory clamps and titanium miniscrews. In 14 cases primary wound healing was uneventful, in 6 cases 4-5 after surgery cutaneus fi tula was noted. In order to close fi tulae, fasciocutaneus neck fl was mobilized in 2 cases and only in 1 case surgery was succesfull. 5 endoprosthesis were removed due to cutting out skin.

Surgical treatment in different types of jaw osteonecrosis can vary from active surgical therapy directed to eliminate exposed necrotic bone and associated purulent discharge and pain syndrome to conservative therapy directed to perform sequestrectomy freely with tweezers. In most cases listed in literature toxic jaw osteonecrosis among drug addicts correspond to stage III medication-related jaw

osteonecrosis [7].

Different comorbidities – association of hepatitis B,C, HIV, tuberculosis, trombophlebitis, mycosis, ascite6 anemia, renal insufficiency among IV drug users



Figure 1 – Patient P, 44. Massive orostoma, facial palsy



Figure 2 – Patient K, 27. CT-scans – massive sequestrum in lower jaw, periosteal accumulaton

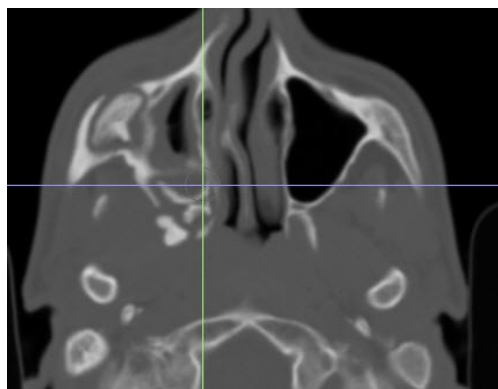


Figure 3 – CT scans – sequestrum in zygomatich bone and pterygoid process



Figure 4 – Panoramic reconstruction of CT scan – total mandibular osteonecrosis

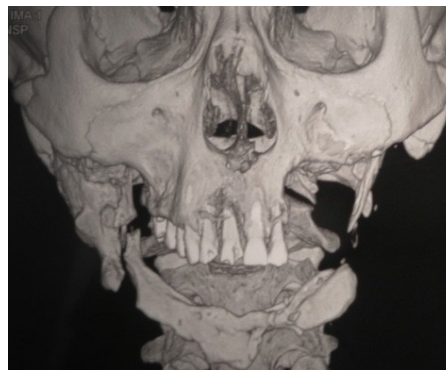


Figure 5 – CTscans – newly formed bone from periosteum after jaw resection

determines surgical treatment to be radical and directed to lower recurrence rate of osteonecrosis. Lethal cases are noted even in maxillofacial departments among this group of patients [1, 2, 3, 4, 5, 6, 8]. During surgical treatment there are no visible signs of demarcation and resection margins have to be at least 5-15 mm from any visible bone changes intraoperatively and have to be correlated with preoperative CT scans.



Figure 6 – Specimen of lower jaw



Figure 7 - Patient K, 33 y.o. OPG after total mandibulectomy, maxillectomy

Custom made nickelid titanium endoprosthesis and nickelid titanium tissue is a method of choice in primary and secondary jaw reconstruction in patients with jaw osteonecrosis among drug abuse patients. Stable long term fixation of these endoprosthesis can be archived with nickelid titanium clamps and titanium miniscrews.

### 3 Summary

Custom made nickelid titanium endoprosthesis and nickelid titanium tissue is a method of choice in primary and secondary jaw reconstruction in patients with jaw osteonecrosis among drug abuse patients. Stable long term fixation of these endoprosthesis can be archived with nickelid titanium clamps and titanium miniscrews.

### 4 Acknowledgments

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