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Recurrent luxation of an individual implant replacing the temporomandibular joint after resection due to rare periosteal chondroma – a case report

Authors:
Kozakiewicz A[1],
Soboń N[1],
Kozakiewicz M DDS, PhD, DrSc, Prof[2],
Wach TJ DDS, PhD[2]*.

Affiliations:

[1]Students Scientific Club by Department of Maxillofacial Surgery, Medical University of Łódź, 251 Pomorska Str., 92-213 Łódź, Poland
[2]Department of Maxillofacial Surgery, Medical University of Łódź, 251 Pomorska Str., 92-213 Łódź, Poland
*Corresponding author: Dr TJ Wach, Department of Maxillofacial Surgery, Medical University of Łódź, 251 Pomorska Str., 92-213 Łódź, Poland, tomasz.wach@umed.lodz.pl; ORCID: 0000-0003-4763-8354
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Abstract

Introduction: Reconstruction of the mandibular condylar process is one of the most challenging procedures in maxillofacial surgery due to the complex anatomy of the temporomandibular joint (TMJ) and to the proximity of the facial nerve. These difficulties are further amplified in situations involving proliferative lesions that require radical resection. Periosteal chondroma is a rare, benign mesenchymal tumor that only exceptionally affects the craniofacial region yet may cause significant functional and aesthetic disturbances.

Case Report: A 39-year-old male presented with progressive facial asymmetry and limited mouth opening. Radiological examination revealed marked enlargement of the left mandibular condyle. The patient underwent resection of the affected condylar process with immediate reconstruction using an individual TMJ endoprosthesis. The postoperative course was complicated by recurrent dislocations of the implant and transient facial nerve dysfunction. Management required repeated reductions, occlusal stabilization with intermaxillary fixation and individualized occlusal splint, intensive physiotherapy, and long-term follow-up. Histopathological examination confirmed the diagnosis of periosteal chondroma. Over time, gradual improvement in mandibular function, facial nerve recovery, and occlusal stability was achieved without evidence of tumor recurrence.

Discussion: The TMJ plays a crucial role in mastication, speech and daily routine, therefore, precise reconstruction after condylar resection is essential. The use of traditional autogenous grafts to replace TMJ is limited by complications such as necrosis, ankylosis, unpredictable bone growth, and fracture. Advances in digital technologies, including Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) and virtual surgical planning, have enabled patient-specific TMJ implants that accurately restore anatomy and mandibular function, with long-term favorable outcomes reported. However, individualized implants remain associated with complications such as implant dislocation. Comprehensive rehabilitation, including physiotherapy and facial nerve monitoring, is crucial to optimize functional recovery and guarantee long-term success.

Conclusions: Successful reconstruction of the mandibular condylar process after tumor resection requires meticulous preoperative planning, stable occlusal support, and coordinated collaboration among surgeons, prosthodontists, physiotherapists, and other specialists.

Keywords: condylar process, temporomandibular joint, periosteal chondroma, individual implant, luxation.

Introduction

Reconstruction of the mandibular condylar process represents one of the most demanding challenges in maxillofacial surgery due to the complex anatomy of the temporomandibular joint (TMJ) as well as the proximity of the facial nerve during surgical access to the operative field [1, 2]. Sensory disturbances of this nerve are among the most common complications following open TMJ arthroplasty procedures [2, 3]. A particular clinical challenge arises in cases requiring resection due to diagnosed proliferative lesions in this region, such as neoplastic lesions. These tumors may lead to significant osseous deformities, resulting in impairment of aesthetics, functional disorders, and pain-related symptoms [4, 5]. The necessity for radical excision of the lesion is often associated with loss of the entire condylar process, which requires a further accurately planned and performed, individualized and stable reconstruction.
In the presented case report, the patient was diagnosed with a periosteal chondroma. This is a benign, slowly growing tumor of mesenchymal origin. Differentiation from malignant tumors is established by thorough histological examination. Radiologically, it is difficult to distinguish between chondroma and chondrosarcoma, with the size as the main indicator - periosteal chondrosarcomas are larger and range from 3 to 14 cm (median size of 4 cm) than chondromas that range from 1 to 6.5 cm (median size of 2.5 cm) [6]. These tumors most commonly occur in the long bones of the upper and lower limbs. In the craniofacial region, they are rare and typically develop beneath the periosteum [7–12].

The aim of this study is to discuss the management of a patient with a proliferative lesion in the TMJ area and to present surgical treatment protocol with individual reconstruction and multiple post-surgical complications.

Case Report

In August 2019, a 39-year-old male patient presented for consultation to the Clinic of the Department of Maxillofacial Surgery of the University Clinical Hospital No. 2 of the Medical University of Łódź due to progressive facial and cervical asymmetry on the left side and problems with mouth opening. First symptoms were observed by the patient approximately 5 years before the visit. The subject denied any systemic diseases, allergies, or chronic use of any medication. Clinical examination revealed a 2-mm left-sided posterior open bite. Subsequently, the patient was referred for ultrasonography to evaluate the left submandibular region and calcifications in the left supraclavicular fossa and to a general practitioner for oral cavity sanitation. Computed tomography (CT) scan demonstrated asymmetry of the condylar process with sclerotic features and marked enlargement of the left mandibular condyle (3.5 × 2.3 cm vs. 1.9 × 1.6 cm on the right), along with proliferative changes, without evidence of bone destruction or cortical disruption (Figures 1–3). A treatment plan was proposed to the patient - excision of the left TMJ tumor with immediate implantation of a personalized TMJ endoprosthesis designed and manufactured by national manufacture (ChM sp. z o.o, Juchnowiec Kościelny, Poland) using an intraoperative splint fixed with intermaxillary fixation (IMF).

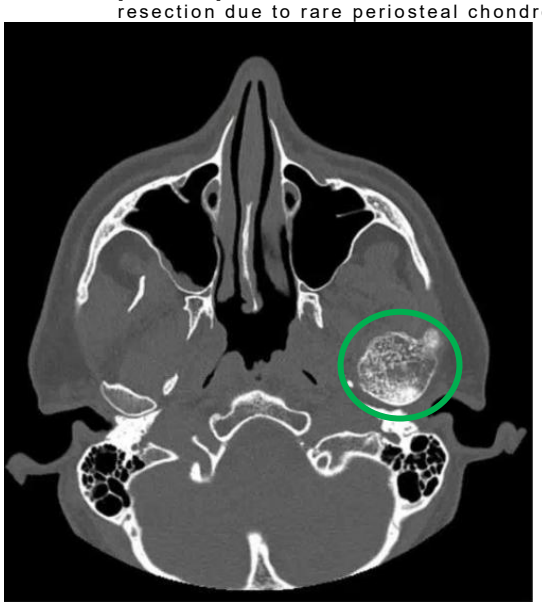

Fig. 1. Computed tomography, axial view. Proliferative lesion of the left TMJ inside the green circle (RadiAnt DICOM Viewer 2025.2).

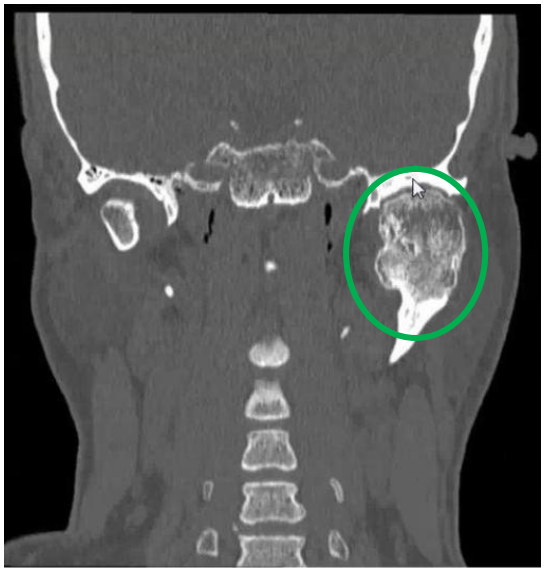

Fig. 2. Computed tomography, coronal view. Proliferative lesion of the left TMJ inside the green circle (RadiAnt DICOM Viewer 2025.2).

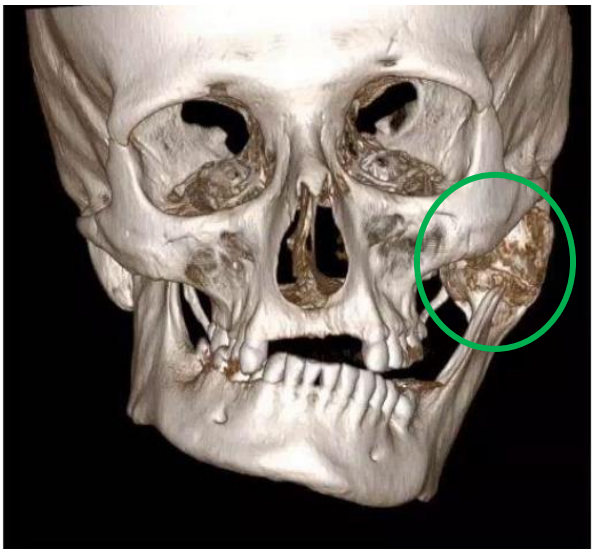

Fig. 3. Computed tomography, 3D reconstruction, anterior view. Proliferative lesion of the left TMJ inside the green circle (RadiAnt DICOM Viewer 2025.2).

Twenty-two months later, during a follow-up visit, the patient was qualified for surgery. Dental impressions and plaster models were prepared, postoperative occlusion was established, an occlusal splint was fabricated, and the patient was referred for scintigraphy examination to assess the activity of the lesion in the left mandibular condyle. Bone scintigraphy demonstrated increased tracer uptake in the region of the left TMJ, which was the primary site of clinical concern. In addition, increased uptake was noted in the projection of the right mandibular angle and in the anterior arches of the left third to fifth ribs. Although rib involvement represents a more typical site of skeletal abnormalities in systemic granulomatous disease, uptake in the mandibular angle is less commonly reported. These additional scintigraphic findings were therefore considered clinically relevant and, in retrospect, supported the need to search for a systemic cause rather than attributing the abnormal scan solely to TMJ pathology. At the subsequent preoperative consultation, the patient reported only mild tenderness on palpation, rated as 1/10 on the pain scale. Clinical examination revealed deviation of the mandibular dental midline to the left and asymmetric lateral mandibular movements, measuring 1 mm to the right and 7 mm to the left.

The patient returned for further assessment in January 2023. By that time, a diagnosis of sarcoidosis had been established during the preceding year, providing a possible systemic explanation for the multifocal scintigraphy abnormalities. The patient was sent to preoperative pulmonology consultation to exclude contraindications to intubation and general anesthesia. Preoperative preparation was initiated, including physiotherapy aimed at improving the myofascial and osteoarticular systems and home-based autotherapy, due to increased tension in the suboccipital muscles, the masticatory muscle group, and the muscles of the floor of the mouth. This preoperative therapy proved effective, as no musculoskeletal complaints were noted during the final preoperative assessment.

Resection of the left mandibular condylar process as well as tumor removal were performed, followed by individualized TMJ arthroplasty. The surgery was performed under antibiotic prophylaxis including Amoksiklav 1.2 g 30 minutes before the surgery and another 1.2 g after 4 hours (beta-lactam antibiotic - amoxicillin 1 g + beta-lactamase inhibitor - clavulanic acid 0.2 g) and Metronidazol Polpharma 0,5% 500 mg 30 minutes before the surgery (metronidazole – antibacterial and antiprotozoal agent of the nitroimidazole class). General anesthesia

was performed with nasotracheal intubation. Surgical access was achieved via a preauricular incision extended temporally and retromandibularly (called hockey stick incision). After soft tissue dissection, all branches of the facial nerve were identified and preserved, allowing access to the articular fossa and the tumor. A trial template was positioned and fixed to the mandibular ramus with three 2.0 x 6.0 mm screws (Figure 4) and to the temporal bone with one 1.5 x 6.0 mm screw (Figure 5), after which tumor resection was performed. The excised lesion was submitted for histopathological examination. The screw bed in the mandibular ramus was prepared. A TMJ fossa component made of ultra-high-molecular-weight polyethylene (UHMW-PE) was trayed and fitted accurately to the osseous substrate. Screw sockets for the definitive fossa component were prepared using the template, and the fossa was stabilized with four dedicated 1.5 × 8.0 mm screws. The template was then removed from the mandibular ramus, and the condylar process implant made of cobalt-chromium-molybdenum alloy (Co-Cr-Mo) was trayed and fixed using nine 2.7 x 8.0 mm screws (Figure 6). Joint range of motion was normal, and occlusion corresponded to the preoperative plan. Local hemostasis was achieved. As the condylar implant was not initially seated within the fossa, the surrounding soft tissues (lateral pterygoid muscle) were sutured to condylar implant neck using non resorbable sutures to guide the implant into the fossa. The wound was closed in layers, secured with Spongostan (Ferrosan Medical Devices, Søborg, Denmark) (a sterile, water-insoluble, malleable, porcine gelatin absorbable sponge intended for obtaining hemostasis), and covered with a sterile compression dressing. After recovery from anesthesia, the patient remained verbally responsive. The dressing was maintained. Vital signs were stable (HR 80/min, BP 161/91 mmHg, SpO_2 97% without oxygen therapy). Postoperatively, motor disturbances of the frontal and buccal branches of the facial nerve were noted, graded as III in House-Brackmann classification. Daily postoperative wound care was performed. Computed tomography scan presented the correct position of individual implant (Figure 7). Two days after surgery, the patient reported no pain. The wound healed properly without exudation.

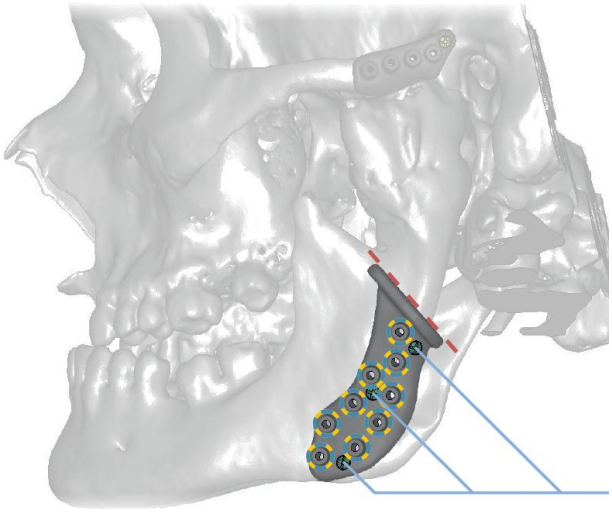

Fig. 4. Project of bone resection template placed over a 3D computed tomography reconstruction. A trial template positioned and fixed to the left mandibular ramus with three 2.0 x 6.0 mm screws (indicated by blue lines).

Fig. 5. Project of TMJ fossa template placed over a 3D computed tomography reconstruction. A trial template positioned and fixed to the temporal bone with one 1.5 x 6.0 mm screw (indicated by blue line).

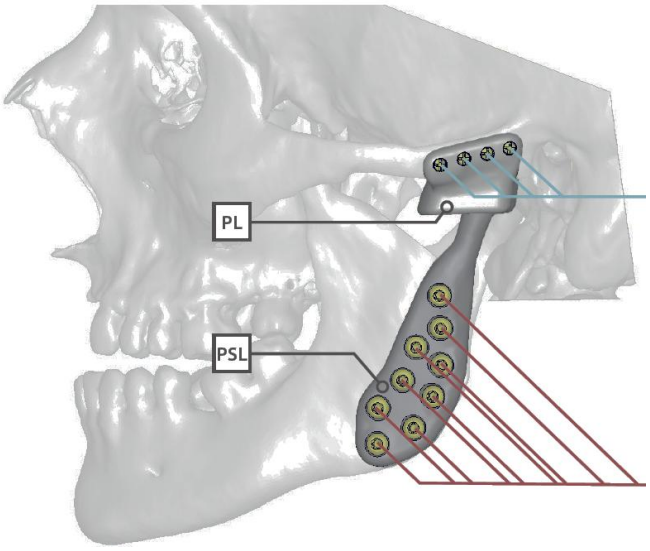

Fig. 6. The TMJ prosthesis components. The TMJ fossa component made of UHMW-PE (marked with “PL”) fitted using the template and stabilized with four dedicated 1.5 × 8.0 mm screws (indicated by blue lines). The condylar process implant made of Co-Cr-Mo alloy (marked with “PSL”) fixed using nine 2.7 x 8.0 mm screws (indicated by red lines). Project placed over a 3D reconstruction.

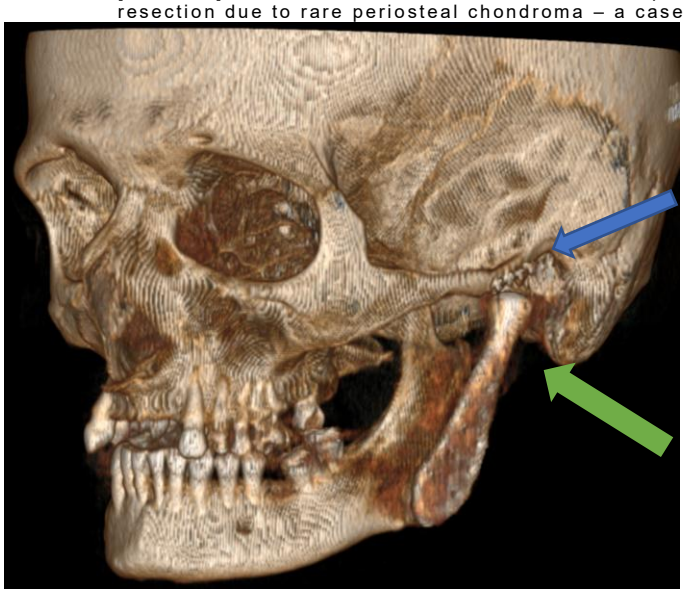

Fig. 7. Post-surgical computed tomography. 3D reconstruction presenting correct placement of the implant (marked by a green arrow) and four dedicated screws (marked by a blue arrow) fixing the TMJ fossa component made of UHMW-PE (radiolucent material – not visible on radiographs) (RadiAnt DICOM Viewer 2025.2).

On the fourth postoperative day, dislocation of the TMJ endoprosthesis was observed (Figure 8). Kinesiotaping was applied, and elastic traction with force directed to the right side was planned. For this purpose, four IMF screws were placed under local anaesthesia.

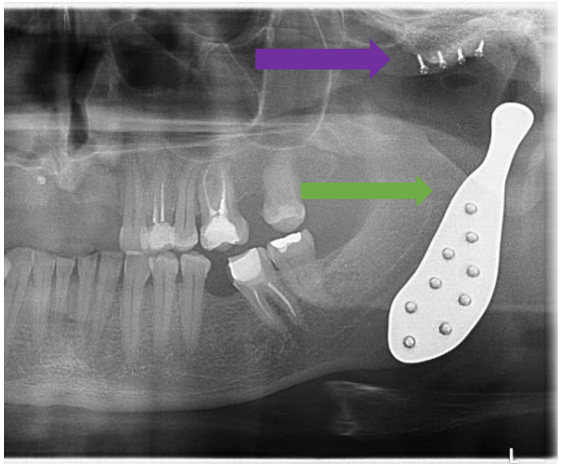

Fig. 8. Orthopantomogram showing the dislocated individual endoprosthesis. The radiolucent TMJ fossa component made of UHMW-PE fixed with 4 screws (indicated by violet arrow). Luxation of radiopaque head of the condylar process implant (made of Co-Cr-Mo alloy, and fixed with 9 screws (indicated by green arrow)). The radiograph was taken 4 days after surgery (RadiAnt DICOM Viewer 2025.2).

The following day, the patient was transferred to the operating theater, where an attempt to set the dislocated left TMJ endoprosthesis was performed under short intravenous general anesthesia. Intraoperative cone beam computed tomography (CBCT) scopy (Ziehm Vision RFD 3D, Ziehm Imaging GmbH, Nuremberg, Germany) demonstrated incorrect mandibular positioning due to the lack of a stable occlusal key, multiple missing teeth, and absence of occlusal support zones. The mandible was repositioned to the most anatomically appropriate position. Elastic intermaxillary traction was released, and a chin cap was applied. Due to unfavorable anatomical conditions, the application of an individualized occlusal splint for stabilization of occlusion was considered.
The patient was sent home the following day due to satisfactory wound healing and absence of complaints, except for persistent facial nerve dysfunction. Postoperative recommendations included a protective lifestyle, cold compresses to the surgical area for three days, avoidance of spicy, hot, and hard foods, liquid diet for up to six weeks, and avoidance of biting solid foods for three months. Daily dressing changes and external wound care with Octenisept (Schülke & Mayr GmbH, Norderstedt, Germany) (broad-spectrum antiseptic with 0,1% Octenidine Dihydrochloride and 2% 2-Phenoxyethanol) were advised, along with lubrification of the external wound using Alantan ointment (Zakłady Farmaceutyczne „UNIA", Warsaw, Poland) (for moisturization and protection of skin with Allantoin and Dexpanthenol; 20 mg + 50 mg/g) three times a day, avoidance of physical exertion and bending, and eye protection measures in case of incomplete eyelid closure (night-time eye patching or use of a moisture chamber and CornereGel – 5% Dexpanthenol to manage eye dryness). The patient was instructed to seek urgent ophthalmologic consultation in case of ocular symptoms. Facial mimic exercises several times daily, adherence to postoperative rehabilitation and physiotherapy, maintenance of the chin cap/elastic traction for up to six weeks, and prosthetic treatment to restore occlusion were also recommended. Pharmacotherapy included Augmentin 1 g every 12 hours for 7 days (beta-lactam antibiotic - amoxicillin 875 mg + beta-lactamase inhibitor - clavulanic acid 125 mg/g), Enterol 250 mg once daily for 7 days (anti-diarrheal product with the yeast Saccharomyces boulardii), Polprazol 20 mg once daily (Omeprazol to reduce the risk of NSAID-induced upper GI bleeding), Dexak 25 mg every 8 hours as needed (maximum 75 mg/day; Dexketoprofen – Non-Steroidal Anti-inflammatory Drug to reduce the pain), Pyralgin 500 mg every 6–8 hours as needed (maximum 4000 mg/day; Metamizole – non-opioid analgesic to reduce the pain), ApoD3 Forte 2000 IU twice daily (used in cases of vitamin D3 deficiency), and Calperos 1000 once daily (1 g of Calcium Carbonate to support bone health).

After eight days patient came back for suture removal. The wound healed uneventfully, and the patient complied with elastic traction and chin cap use. However, another dislocation of the individualized implant was detected (Figure 9). Facial nerve disfunction persisted with grade III of House–Brackmann classification. Milgamma N (i.m.; Vitamin B1 100 mg + Vitamin B6 100 mg + Vitamin B12 1 mg) and Nivalin (i.m. Galantamini hydrobromidum 5 mg) were implemented, both to treat facial nerve paraesthesia.

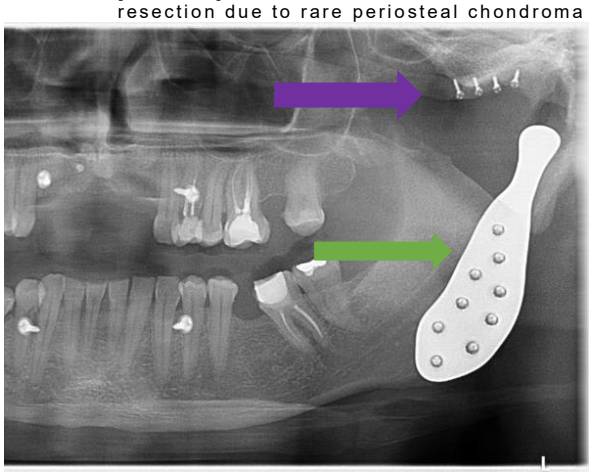

Fig. 9. Orthopantomogram showing the second diagnosed luxation of individual implant. The radiolucent TMJ fossa component made of UHMW-PE fixed with 4 screws (indicated by violet arrow) and dislocated radiopaque head of the condylar process implant made of Co-Cr-Mo alloy fixed with 9 screws (indicated by green arrow). The radiograph was taken 14 days after surgery (RadiAnt DICOM Viewer 2025.2).

Five days later, the patient was readmitted for reduction of the dislocated left TMJ implant and placement of an individualized occlusal splint to stabilize occlusal contacts under intravenous general anesthesia. The patient was send home the next day in good general condition, with repeated recommendations and properly healing wounds.

One week later, the patient returned for suture removal and review of histopathological results. The lesion consisted of fragments of compact and spongy bone with yellow marrow and nodular areas of normal cartilage, consistent with a diagnosis of periosteal chondroma. Follow-up examination revealed improvement in left eyelid closure, with persistent dysfunction of the temporal branch of the facial nerve. Intermaxillary relations remained stable due to applied immobilization. External and intraoral manual therapy was performed on muscle structures potentially responsible for lateral movements to the right, including the middle and posterior fibers of the right temporalis muscle and the deep head of the right masseteric muscle. Tension within the muscles of the floor of the mouth was also addressed via an external approach. Local massage was applied to improve vascularity in the area of facial nerve dysfunction. Neurovit (for treatment of nervous system disorders Vitamin B1 100 mg + Vitamin B6 200 mg + Vitamin B12 0,2 mg) was prescribed (3 × 1 tablet daily for one month, followed by 1 tablet daily), and CT scan was ordered to assess reconstruction and implant positioning 2 months after the surgery.

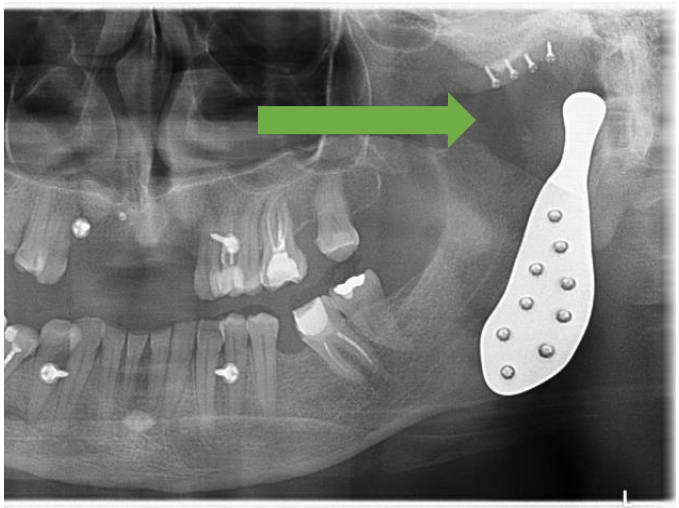

Fig. 10. Orthopantomogram presenting displacement of the implant (green arrow). Radiological examination was performed 2 months after the surgery (RadiAnt DICOM Viewer 2025.2).

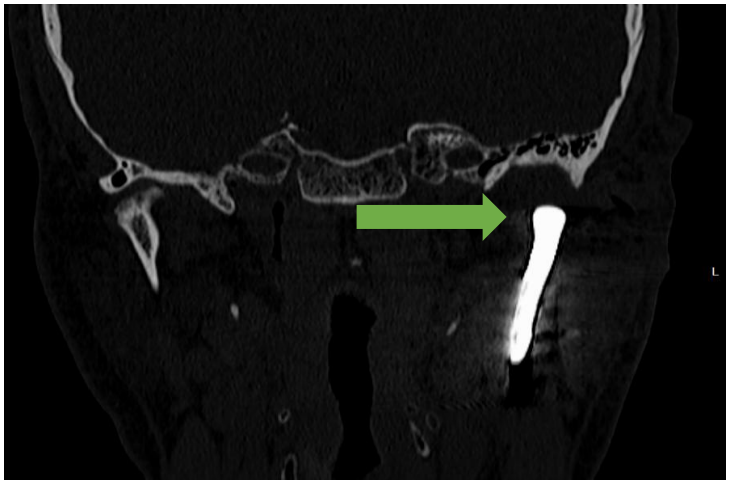

Fig. 11. Computed tomography scan, frontal view. Displacement of the implant (green arrow). Radiological examination was performed 2 months after the surgery (RadiAnt DICOM Viewer 2025.2).

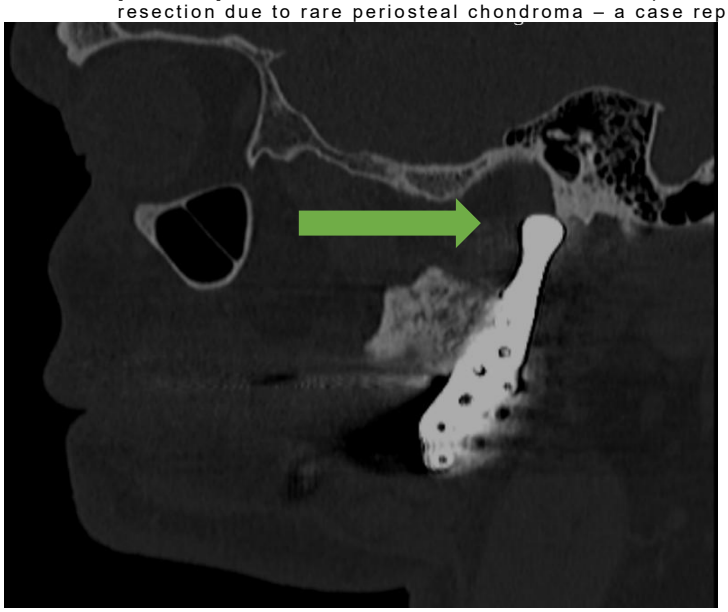

Fig. 12. Computed tomography scan, sagittal view. Displacement of the implant (green arrow). Radiological examination was performed 2 months after the surgery (RadiAnt DICOM Viewer 2025.2).

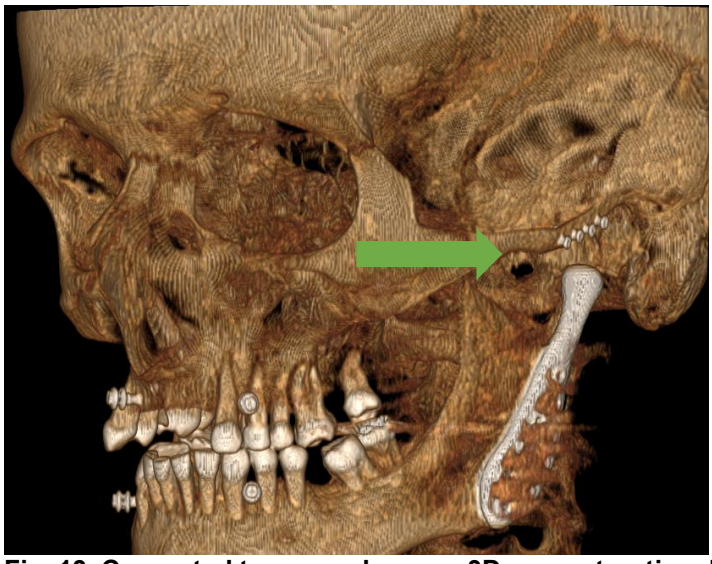

Fig. 13. Computed tomography scan 3D reconstruction. Displacement of the implant (green arrow). Four IMF screws are visible (in green circles). Radiological examination was performed 2 months after the surgery (RadiAnt DICOM Viewer 2025.2).

Twenty-five days later, the patient presented with otalgia. Panoramic radiography followed by CT scan revealed another displacement of the implant outside the articular fossa (Figures 10-13). Under local anesthesia of the masseteric muscles, the individualized implant was set. During manipulation, one IMF screw was removed, and

elastic traction was applied to the remaining screws. The patient was advised to maintain a protective lifestyle, apply cold compresses, continue elastic traction for two weeks, and to use tube feeding introduced behind the molar teeth.

Three days later, due to postoperative edema, manual lymphatic drainage was performed, home-based drainage instructions were provided, and scar care and mobilization principles were explained.

One month later, clinical examination revealed limited mouth opening up to 5 mm. Palpable movements of the endoprosthesis in the correct position were noted. Mandibular retrusion returned to the original occlusal conditions. A follow-up panoramic radiograph was ordered (Figure 14). Elastic traction and five IMF screws were removed, and the patient was informed that surgical treatment had been completed. The patient attended follow-up visits in March and early June 2024. In March, improvement in facial nerve sensory disturbances was noted, with a reduction in the House–Brackmann classification from III to II grade, and mandibular abduction increased to 13 mm. Lateral movements remained limited to 3 mm to the left, with no active movement to the right. The midline was shifted 6 mm to the left. The patient was referred for prosthetic rehabilitation to restore missing teeth, and for CT scan to monitor implant positioning. Imaging revealed the fossa component positioned within the glenoid fossa and articular eminence, fixed to the zygomatic arch with metal components, while the prosthetic head was displaced posteriorly and slightly laterally relative to the artificial fossa (Figure 15). During June 2024 visit further improvement in maximal mouth opening was observed (up to 24 mm), without improvement in lateral movements. Continuous masticatory rehabilitation, physiotherapy, and autotherapy resulted in improved alignment of the mandibular dental midline relative to the maxilla and improved lateral movement to the left.

At a 3-month follow-up visit, CT scan confirmed stable implant positioning (Figure 16). Surgical correction of the left condylar component via an external approach with circumferential mandibular incision, IMF-based occlusal stabilization, and prosthetic reconstruction were considered. However, due to achieved mandibular abduction, occlusal stabilization, absence of pain, and improved facial aesthetics, the patient declined further surgical intervention.

During two subsequent follow-up visits at accordingly 2-month and 10-month intervals, additional CT scans demonstrated no changes in implant positioning and no evidence of chondroma recurrence (Figures 17, 18). Ongoing rehabilitation resulted in significant functional improvement, with maximal mouth opening of 38 mm and lateral excursions of 2 mm to both the right and left sides. Changes in active mandible movements were presented in Table 1. The patient was scheduled for another follow-up visit in one year.

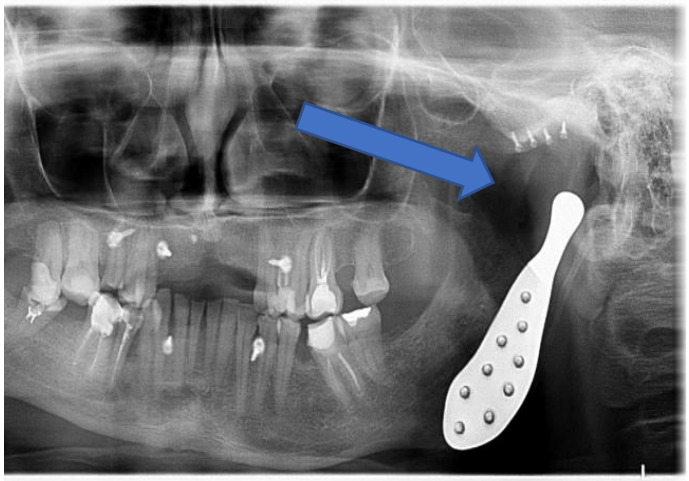

Fig. 14. Orthopantomogram of the individual implant's stable position during follow-up 3 months after the surgery presenting stable implant positioning. The prosthetic head was displaced posteriorly and slightly laterally relative to the artificial fossa (indicated by blue arrow) (RadiAnt DICOM Viewer 2025.2).

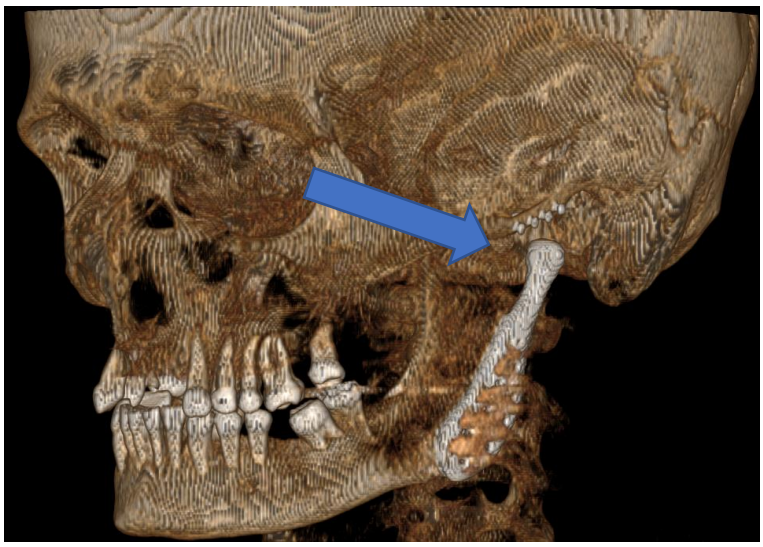

Fig. 15. 3D reconstruction of the individual implant's stable position during follow-up 5 months after the surgery presenting stable implant positioning. The prosthetic head was displaced posteriorly and slightly laterally relative to the artificial fossa (indicated by blue arrow) (RadiAnt DICOM Viewer 2025.2).

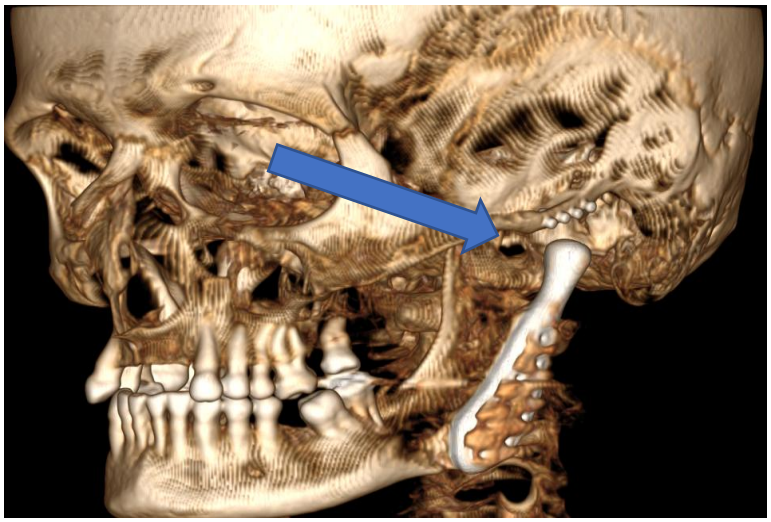

Fig. 16. 3D reconstruction of the individual implant's stable position during follow-up 11 months after the surgery presenting stable implant positioning. The prosthetic head was displaced posteriorly and slightly laterally relative to the artificial fossa (indicated by blue arrow) (RadiAnt DICOM Viewer 2025.2).

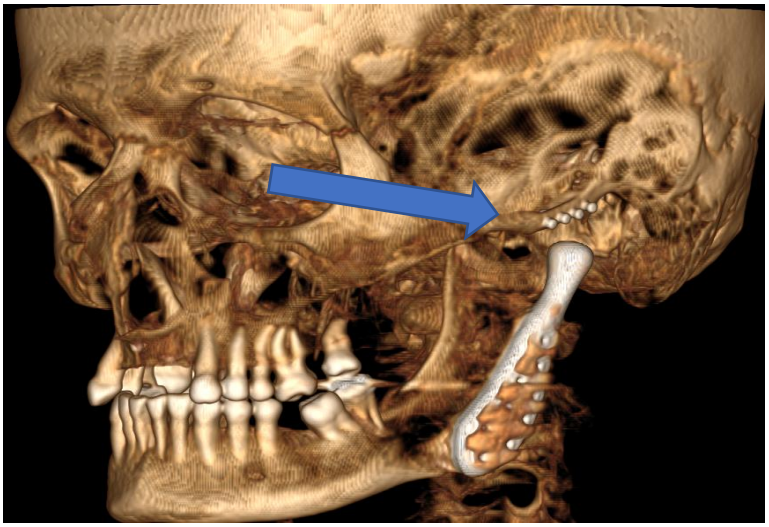

Fig. 17. 3D reconstruction of the individual implant's stable position during follow-up 13 months after the surgery presenting stable implant positioning. The prosthetic head was displaced posteriorly and slightly laterally relative to the artificial fossa (indicated by blue arrow) (RadiAnt DICOM Viewer 2025.2).

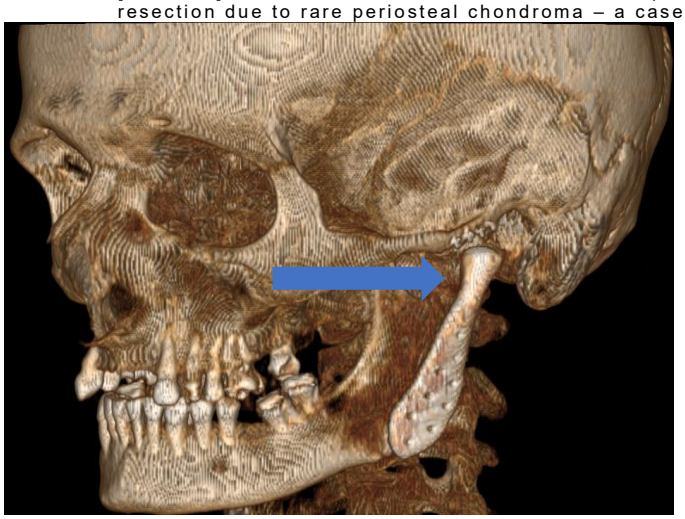

Fig. 18. 3D reconstruction of the individual implant's stable position during follow-up 23 months after the surgery presenting stable implant positioning. The prosthetic head was displaced posteriorly and slightly laterally relative to the artificial fossa (indicated by blue arrow) (RadiAnt DICOM Viewer 2025.2).

Table 1. Monitoring active movements of mandible after the surgery.

Follow-up visit	Midline	Maximal interincisal opening	Protrusion	Laterotrusion	
				To the right	To the left
Preoperatively	Mandible rotated due to the tumor	29mm	0mm	1mm	7mm
January, 3 moths after surgery	6mm shifted to the left	5mm	0mm	0mm	3mm
March 2024, 5 months after surgery	6mm shifted to the left	13mm	0mm	0mm	3mm
June 2024, 8 months after surgery	6mm shifted to the left	24mm	0mm	0mm	3mm
September 2024, 11 months after surgery	4mm shifted to the left	22mm	0mm	0mm	3mm
November 2024, 1 year and 1 month after surgery	4-5mm shifted to the left	29mm	0mm	3mm	2mm
September 2025, 1 year and 11 months after surgery	6mm shifted to the left	38mm	0mm	2mm	2mm

Discussion

Chondroma is usually located within the bone, called “endochondromas”, however 20% of these lesions are periosteal chondroma arising on the tissue beneath the periosteum [13]. Chondroma accounts for 2.2% of all benign tumors [14]. Usual location of periosteal chondroma are tubular bones, most commonly in the femur but also in the rib, sacrum and ilium [13]. Periosteal chondroma arising in the head and neck region is extremely rare. In the literature, frequency of its diagnosis in described area is reported to be 0.32% [15]. Periosteal chondroma is usually localized at the skull base, in sella turcica area and in the posterior fossa. This neoplastic lesion is composed of mature hyaline cartilage [16]. Most cases are detected in patients aged between 20 and 40 years; however, cases occurring in the 1st and 8th decades of life have also been reported [16, 17]. Due to slow growth, patients are often diagnosed after many years, which was also the case for our patient. Some authors claim that these tumors undergo transformation into malignant lesions [17]. The standard of treatment is surgical excision of the chondroma with a 1 cm tissue margin [17]. As in the case of presented patient, tumor of the head of the

mandible necessitates a treatment that resulted in the loss of TMJ. This seriously impairs patients' health and must be followed by reconstruction closely imitating a healthy TMJ.

The TMJ plays an essential role in mastication, speech, and mandibular mobility. Therefore, limitation of mouth opening, joint sounds, or pain may substantially impair patients' daily functioning and quality of life. In addition to these functional consequences, TMJdisorders have been associated with psychosocial distress [18]. In this context, accurate anatomical and functional reconstruction after resection is important not only to restore mandibular continuity, but also to preserve occlusion, joint mobility, facial symmetry, and overall patient well-being. Traditional methods of condylar process reconstruction, including non-vascularized costochondral grafts or coronoid process grafts, are associated with considerable limitations [19, 20]. These include graft resorption or necrosis, ankylosis, unpredictable growth behavior, and fracture [19, 20].

Advances in digital technologies, including 3D imaging, computer-assisted planning, CAD/CAM techniques, and virtual surgical planning, have enabled more precise and less invasive surgical procedures [21–23]. Patient-specific mandibular condylar reconstruction implants allow accurate restoration of lost anatomical structures, considering the individual morphological conditions of each patient and enabling replication of natural mandibular movements [19, 22]. The additional use of customized occlusal splints contributes to improving TMJ stability, optimization of occlusal relationships, and patient adaptation to the new postoperative mandibular position [23, 24]. The literature provides evidence of proper function of reconstructions fabricated using modern technologies even after 21 years of follow-up [25].

Despite being designed and manufactured for a specific patient, the use of individualized implants is also associated with a risk of complications, both intraoperative and postoperative. Complications can occur in almost 40% of cases presenting symptoms such as chronic pain and postoperative bleeding, wound infections, occlusal disturbances, facial nerve palsy, and dislocations of endoprostheses [26]. The last one listed which is described in our case is extremely rare, occurring only in 2.4% of surgeries [26]. Intraoperative dislocation of TMJ individualized implants occurs in 8% of cases most frequently in cases associated with coronoidectomy and inflammatory arthropathies [27, 28]. After the application of appropriate preventive measures (intermaxillary elastic traction and mouth exercises for 1 week, treatment of possibly present masticatory dystonia with botulinum toxin), this risk decreases to less than 1% [27]. In cases where dislocation occurred, the use of intermaxillary guidance for 1 week resulted in improvement in over 90% of cases, while extension to 3 weeks and use of botulinum toxin resolved all cases without recurrent dislocations [27]. Predisposing factors for recurrent dislocations of the natural TMJ involve female gender, connective tissue diseases, muscular dystonia (also observed in cases of isolated implant dislocations), insufficient soft tissue support, general ligamentous and capsular laxity, eminence erosion, and flattening. Additional observed correlations include specific medications used in psychological or psychiatric treatment, anatomical abnormalities, tooth abrasion, severe malocclusion and loss of dentition [29–31]. We suspect that the cause of the presented series of individual implant luxations occurred due to soft tissue stretching and loss of structural support secondary to the growth of a proliferative lesion, identified as a periosteal chondroma, as these are known causes of dislocations in patients without reconstructed TMJ [29]. Another reason could be the not following the postoperative recommendations by the patient. Due to complications, implants must be removed in approximately 1.5% of cases; however, standard implants are more prone to complications, ultimately necessitating implant removal [26]. The authors decided to pursue a minimally invasive approach, postponing the decision regarding possible explantation until it becomes mandatory. Operative reduction of the dislocated TMJ implant combined with occlusal stabilization has so far yielded satisfactory results, with no further luxations observed to date.

Physiotherapy constitutes an integral component of the management of patients after TMJ surgery. Its application reduces pain and postoperative edema, increases the range of motion measured during functional examination,

and improves muscle perfusion. In patients who do not undergo physiotherapy, speech impairment has also been reported [23, 32–35]. In the presented case, both preoperative myofascial preparation and postoperative rehabilitation played a significant role in reducing muscle tension and improving mandibular abduction and lateral excursion movements.

Facial nerve dysfunction observed in the patient is a common complication of procedures requiring surgical access to the mandibular condylar process by preauricular approach, both in cases of ankylosis and proliferative lesions [36, 37]. Such disturbances may occur in up to 55% of cases [36]. In most patients, facial nerve dysfunction is transient and appropriately conducted therapy promotes gradual recovery of nerve function, usually within six months after surgery [36, 38]. Classification of facial nerve palsy according to the six-grade House–Brackmann scale (Table 2) is essential for assessing the severity of nerve injury and monitoring treatment outcomes [36–40].

Table 2. Description of House-Brackmann scale [40].

	Grade	**Defined by**
I	Normal	Normal facial function in all areas.
II	Mild disfunction	Slight weakness noticeable only on close inspection. At rest: normal symmetry of forehead, ability to close eye with minimal effort and slight asymmetry, ability to move corners of mouth with maximal effort and slight asymmetry. No synkinesis, contracture, or hemifacial spasm. Observed in patient after applied therapy.
III	Moderate disfunction	Obvious but not disfiguring difference between two sides, no functional impairment; noticeable but not severe synkinesis, contracture, and/or hemifacial spasm. At rest: normal symmetry and tone. Motion: slight to no movement of forehead, ability to close eye with maximal effort and obvious asymmetry, ability to move corners of mouth with maximal effort and obvious asymmetry. Patients who have obvious but not disfiguring synkinesis, contracture, and/or hemifacial spasm are grade III regardless of degree of motor activity. Observed in patient post-surgically.
IV	Moderately severe disfunction	Obvious weakness and/or disfiguring asymmetry. At rest: normal symmetry and tone. Motion: no movement of forehead; inability to close eye completely with maximal effort. Patients with synkinesis, mass action, and/or hemifacial spasm severe enough to interfere with function are grade IV regardless of motor activity.
V	Severe disfunction	Only barely perceptible motion. At rest: possible asymmetry with droop of corner of mouth and decreased or absence of nasal labial fold. Motion: no movement of forehead, incomplete closure of eye and only slight movement of lid with maximal effort, slight movement of corner of mouth. Synkinesis, contracture, and hemifacial spasm usually absent.
VI	Total paralysis	Loss of tone; asymmetry; no motion; no synkinesis, contracture, or hemifacial spasm.

Resection of the mandibular condylar process followed by reconstruction constitutes a highly complex surgical procedure. Difficulty is encountered in cases involving proliferative lesions, such as tumors. To achieve long-term therapeutic success, interdisciplinary treatment is required encompassing collaboration between the maxillofacial

surgeon, physiotherapist, prosthodontist, as well as manufacturers responsible for fabricating individualized replacements of the resected tissues.

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- **Informed consent**: Has not been obtained as patient described in the case report cannot be identifiable. No private data were provided and photographic documentation was anonymized.

Authors contribution:

Authors Kozakiewicz Adam and Soboń Norbert contributed equally and share first authorship.

Author	Contributor role
Kozakiewicz Adam	Conceptualization, Methodology, Software, Investigation, Writing - Original Draft, Visualization, Data curation
Soboń Norbert	Conceptualization, Methodology, Software, Investigation, Writing - Original Draft, Visualization, Data curation
Kozakiewicz Marcin	Conceptualization, Methodology, Validation, Software, Writing - Review & Editing, Supervision
Wach Tomasz Jarosław	Conceptualization, Methodology, Validation, Investigation, Writing - Review & Editing, Visualization, Supervision, Projectadministration

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