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SYNOVIAL CYST OF THE TEMPOROMANDIBULAR JOINT

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SUMMARY

Synovial cysts of the temporomandibular joint (TMJ) are benign, true cystic lesions. Their walls are lined by flattened or cuboidal cells of synovial origin. They contain gelatinous material – a secretion of the cells. The etiology is related to trauma and/or developmental disorder of TMJ. The differentiation includes salivary gland cysts, pharyngeal cysts of branchial origin and tumors of the preauricular area. Diagnostics consists of MR/CT imaging and histopathologic examination. Treatment focuses on complete or incomplete cyst excision. In this report, we describe a case of a 53-year-old female with a synovial cyst in the right TMJ area.

Keywords: temporomandibular joint, synovial cyst

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TORBIEL BŁONY MAZIOWEJ STAWU SKRONIOWO-ŻUCHWOWEGO

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STRESZCZENIE

Torbiel maziówkowa stawu skroniowo-żuchwowego (SSŻ) to łagodna zmiana z grupy torbieli prawdziwych. Wyścielona jest od wewnątrz komórkami nabłonkowymi płaskimi bądź sześciennymi pochodzącymi z błony maziowej. W jej świetle znajduje się galaretowaty płyn – wydzielina tych komórek. W etiologii wskazuje się na tło urazowe bądź zaburzenia rozwojowe stawu. W różnicowaniu uwzględnić należy torbiele ślinianek, torbiele skrzelopochodne i nowotwory tej okolicy. Diagnostyka opiera się o badania obrazowe MR/TK i badanie histopatologiczne. Leczenie obejmuje całkowite lub częściowe usunięcie torbieli. W niniejszej publikacji opisano przypadek 53-letniej pacjentki, u której zdiagnozowano torbiel maziówkową w okolicy prawego stawu skroniowo-żuchwowego.

Słowa kluczowe: staw skroniowo-żuchwowy, torbiel maziówkowa

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Introduction

Synovial cysts of the TMJ have been documented several times (Ali *et al.*, 2006; Ansari *et al.*, 2013; Bonacci *et al.*, 1996; Deng *et al.*, 2010; Farole *et al.*, 1991; Heng-Kun *et al.*, 2014; Levarek *et al.*, 2016; Mumert *et al.*, 2012; Nahlieli *et al.*, 2000; Spinzia *et al.*,

2011; Steen *et al.*, 2015; Takaku *et al.*, 2001; Vera-Sirera *et al.*, 2013; Zheng *et al.*, 2015). They are usually present on the extensor surface of the wrist and to a lesser extent on the dorsal surface of the foot and lateral aspect of the knee (Ali *et al.*, 2006) and intervertebral joint (Jankowski *et al.*, 2012). They are benign cystic lesions lined by flattened or cuboidal cells of synovial origin. They contain gelatinous material. The etiology is not yet precisely known. Synovial cyst is apparently a result of trauma in the TMJ area or displacement and/or herniation of the synovial lining. Most of the cases have been observed in females (Ali *et al.*, 2006; Levarek *et al.*, 2016; Mumert *et al.*, 2012; Silva *et al.*, 2005; Spinzia *et al.*, 2011; Steen *et al.*, 2015; Takaku *et al.*, 2001; Vera-Sirera *et al.*, 2013; Wu *et al.*, 2011; Zheng *et al.*, 2015). The most common symptoms are swelling, pain caused by the auriculotemporal nerve compression, and tenderness of the TMJ region. (Ali *et al.*, 2006; Ansari *et al.*, 2013; Bonacci *et al.*, 1996; Deng *et al.*, 2010; Farole *et al.*, 1991; Heng-Kun *et al.*, 2014; Levarek *et al.*, 2016; Mumert *et al.*, 2012; Nahlieli *et al.*, 2000; Partridge *et al.*, 2016; Savolainen *et al.*, 2013; ; Silva *et al.*, 2005; Spinzia *et al.*, 2011; Steen *et al.*, 2015; Takaku *et al.*, 2001; Vera-Sirera *et al.*, 2013; Wu *et al.*, 2011; Zheng *et al.*, 2015).

The treatment options of the ganglion cyst and synovial cyst vary from conservative treatment to surgical removal. The surgical excision of symptomatic ganglion cysts of TMJ remains the mainstay of the treatment, with the most common complication being recurrence due to incomplete excision. Surgical excision has usually been performed by using a preauricular approach and is considered to be the procedure of choice. Although there is a case establishing facial nerve palsy and intracranial extension, patients with asymptomatic lesions may undergo some period of conservative management, because there are some cases of spontaneous regression (Silva *et al.*, 2005).

Aim

The aim of the work is to present diagnostic and treatment methods of 53-years-old female with a synovial cyst in the right TMJ area.

Material and methods

Patients presentation

A 53-year-old woman, presented with painless, immovable prominence within the right TMJ region. The lesion appeared, a year after an injury of the right side of the face (resulting in a loss of consciousness). The patient's past medical history included a thyroidectomy for Hashimoto's thyroiditis. The woman was currently taking Euthyrox N 125. Physical examination showed normal mandibular range of motion, with no sound in the TMJ. There was no facial nerve paresis or paralysis.

CT examination revealed an irregular (Figures 1 and 2) hypodense lesion of size of 30 × 17 × 5 mm in the infratemporal fossa, along the bottom surface of the greater wing of the sphenoid bone, medially reaching the lateral pterygoid plate, about 6 mm from the condyloid process. There was no sign of bone loss. Lesion did not intensify after an injection of a contrast medium.

The site was approached under general anesthesia through a preauricular incision. Intraoperative examination showed fragments of a fibrous membrane containing the glandular epithelial cells with multilayer features, and a small cartilaginous lesion. The malignancy of the lesion was ruled out. The cyst was fragmentally removed and the wound healed uneventfully. The patient was discharged in good condition on the postoperative day 2. She was prescribed mechanotherapy of the TMJ which consisted in gradual opening of the jaw with the help of wooden spatula until a satisfactory mouth opening range was achieved.

Histopathologic examination showed a sclerosing fibroconnective tissue with vessels, nerves and mild chronical inflammation process. The lesion was not malignant. (Figure 3).

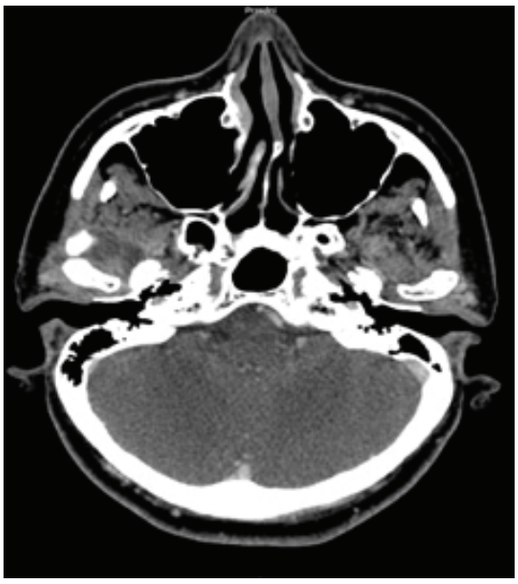

Figure 1. CT scan – axial section. Shows an irregular hypodense lesion in the right side of infratemporal fossa.

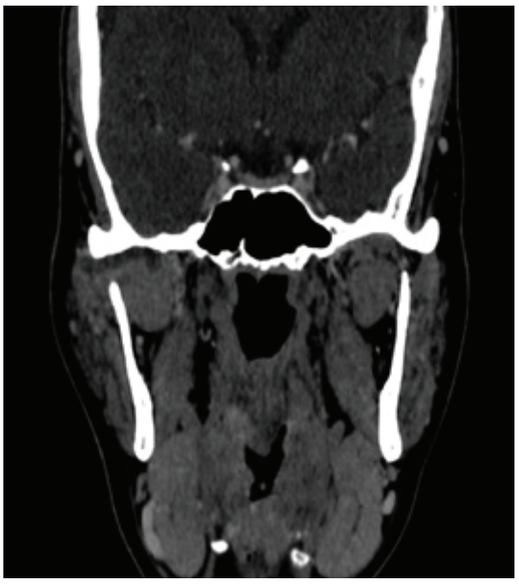

Figure 2. 2 CT scan – frontal section. Shows an irregular hypodense lesion in the right side of the infratemporal fossa.

A follow-up MR examination one year later showed no recurrence in the TMJ region (Figures 4 and 5). However, there was a tumor derived from astrocytes found in the brain tissue, which was removed a few months later in a neurosurgery clinic.

Five years after the surgery, during a check-up, crepitation of the right TMJ and clicking in the left TMJ were noticed. There was no sound during laterotrusion, no intraoral or extraoral painful spots. The woman noticed jaw protrusion. The follow-up showed no pain during maximum incisal opening and it was still possible to passively open the mouth further. Since the surgery, the patient has reported pain when touched in the right TMJ area. No sign of damage to the facial nerve (Figures 6–8).

Discussion

In literature, synovial cysts are often identified with ganglion cysts (Ali *et al.*, 2006; Bonacci *et al.*, 1996; Levarek *et al.*, 2016; Nahlieli *et al.*, 2000; Partridge *et al.*, 2016; Silva *et al.*, 2005; Spinzia *et al.*, 2011; Vera-Sirera *et al.*, 2013; Wu *et al.*, 2011).

A synovial cyst is a true cyst lined by synovial cells which contain gelatinous mass and might or might not communicate with the joint cavity. A ganglion cyst is lined by a fibrous connective tissue that does not communicate with the joint cavity. It is believed that synovial cysts as well as ganglion cysts occur as a result of trauma of the TMJ area. Furthermore, synovial cysts can occur as a result of an inflammatory process or displacement of the synovial lining. (Ali *et al.*, 2006; Ansari *et al.*, 2013; Bonacci *et al.*, 1996; Deng *et al.*, 2010; Farole *et al.*, 1991; Heng-Kun *et al.*, 2014; Levarek *et al.*, 2016; Mumert *et al.*, 2012; Nahlieli *et al.*, 2000; Partridge *et al.*, 2016; Savolainen *et al.*, 2013; Silva *et al.*, 2005; Spinzia *et al.*, 2011; Steen *et al.*, 2015; Takaku *et al.*, 2001; Vera-Sirera *et al.*, 2013; Wu *et al.*, 2011; Zheng *et al.*, 2015).

Patients usually present with swelling and tenderness of the TMJ region, especially during mouth opening (Ali *et al.*, 2006; Ansari *et al.*, 2013; Bonacci *et al.*, 1996; Deng *et al.*, 2010; Farole *et al.*, 1991; Heng-Kun *et al.*, 2014; Levarek *et al.*, 2016; Mumert *et al.*, 2012; Nahlieli *et al.*, 2000; Partridge *et al.*, 2016; Savolainen *et al.*, 2013; Silva *et al.*, 2005; Spinzia *et al.*, 2011; Steen *et al.*, 2015; Takaku *et al.*, 2001; Vera-Sirera *et al.*,

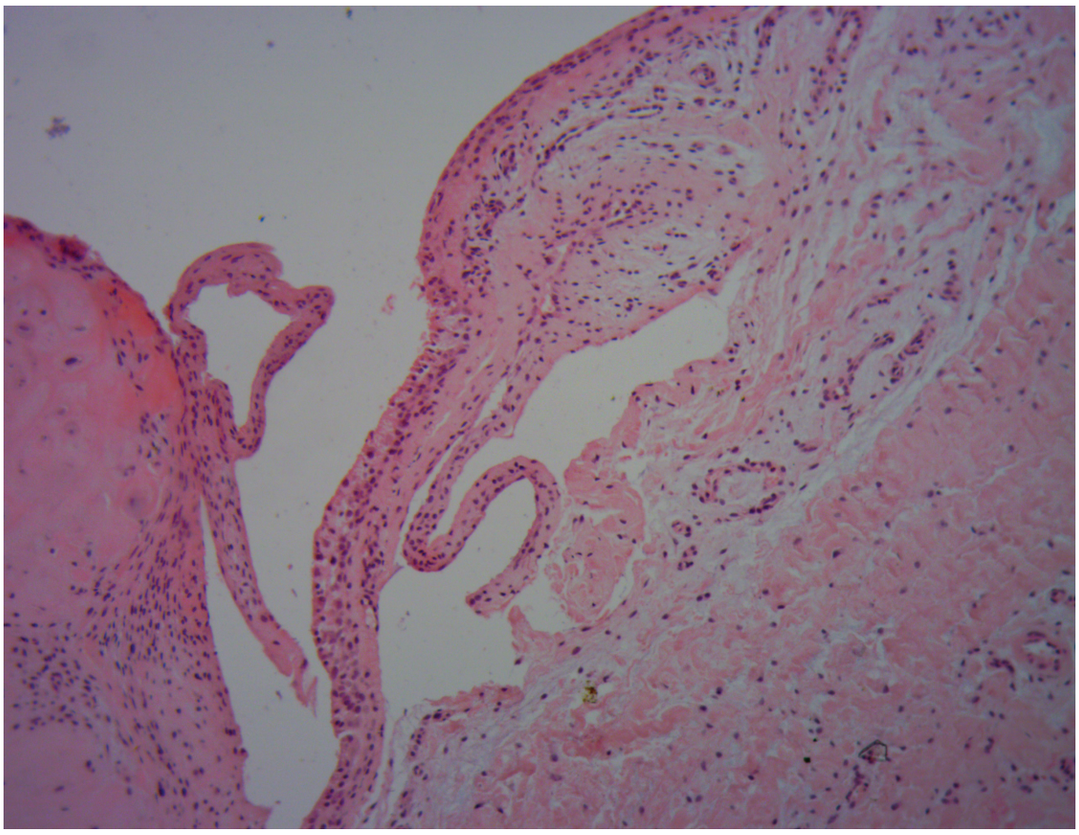

Figure 3. A fragment of articular cartilage and fibrous membrane of the cyst. H + E Stain. 100× magnification.

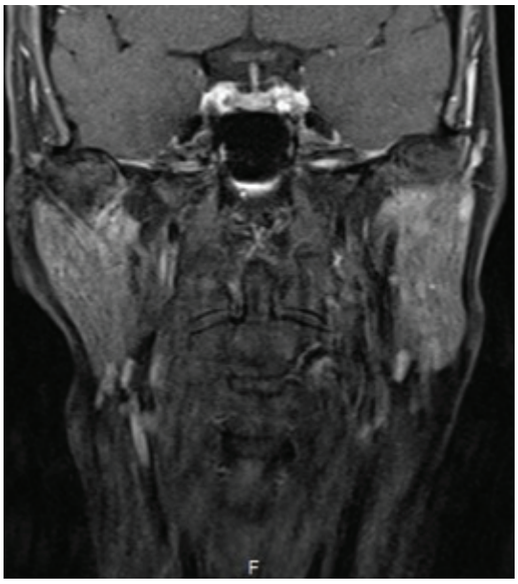

Figure 4. MRI – T1-Weighted Image. Frontal section. Follow-up MRI shows no presence of new lesions in the right side of TMJ area.

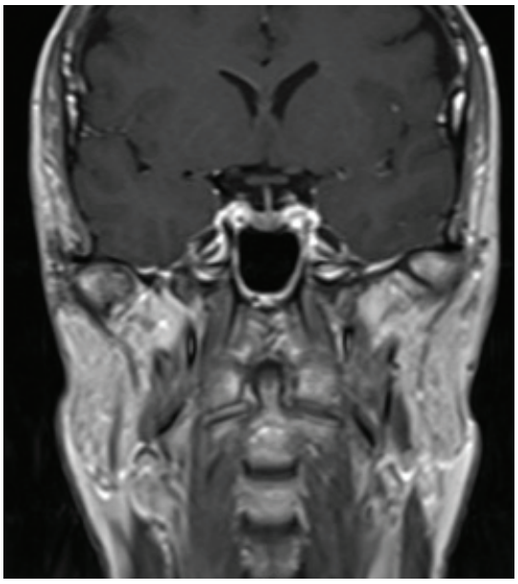

Figure 5. MRI – T2-Weighted Image. Frontal section. Follow-up MRI shows no presence of new lesions in the right side of TMJ area. Visible symmetry of both articular slits.

2013; Wu *et al.*, 2011; Zheng *et al.*, 2015). Pain may be due to auriculotemporal nerve compression (Ali *et al.*, 2006; Ansari *et al.*, 2013; Levarek *et al.*, 2016; Savolainen *et al.*, 2013).

Figure 6. The patient five years after the surgery – no signs of facial nerve paresis or paralysis.

Figure 7. The patient five years after the surgery – correct range of mouth opening.

Figure 8. The patient five years after the surgery – preauricular incision scar.

Mumert *et al.*, suggest symptoms of Bell's palsy in certain cases of cysts (Mumert *et al.*, 2012). Trismus is also likely to occur, along with the symptoms of tissue inflammation (Bonacci *et al.*, 1996; Silva *et al.*, 2005).

In differential diagnosis tumors and cysts of parotid gland, retention cysts, sebaceous cysts, and pharyngeal cysts of branchial origin and benign tumors of the preauricular area should be taken into consideration (Farole *et al.*, 1991; Heng-Kun *et al.*, 2014; Nahlieli *et al.*, 2000; Savolainen *et al.*, 2013; Silva *et al.*, 2005; Spinzia *et al.*, 2011; Steen *et al.*, 2015; Takaku *et al.*, 2001; Wu *et al.*, 2011).

In diagnostics we use CT/MR imaging. (Ali *et al.*, 2006; Ansari *et al.*, 2013; Bonacci *et al.*, 1996; Deng *et al.*, 2010; Farole *et al.*, 1991; Heng-Kun *et al.*, 2014; Levarek *et al.*, 2016; Mumert *et al.*, 2012; Nahlieli *et al.*, 2000; Partridge *et al.*, 2016; Savolainen *et al.*, 2013; Silva *et al.*, 2005; Spinzia *et al.*, 2011; Takaku *et al.*, 2001; Vera-Sirera *et al.*, 2013; Wu *et al.*, 2011; Zheng *et al.*, 2015). We believe that MR is a better choice since it targets soft tissue. Some of the researchers have noted that lesions missed by CT scans were visible in MRI (Heng-Kun *et al.*, 2014).

Ultrasonography is important in both: detecting the presence of lesion and distinguishing between synovial cyst (hypoechogenic lesions) and ganglion cyst (hypoechogenic lesions with hyperechogenic wall or nonechogenic) (Ali *et al.*, 2006; Bonacci *et al.*, 1996; Heng-Kun *et al.*, 2014; Nahlieli *et al.*, 2000; Savolainen *et al.*, 2013; Spinzia *et al.*, 2011; Steen *et al.*, 2015; Takaku *et al.*, 2001; Wu *et al.*, 2011). In our opinion, this

method is not sufficient enough to give a definitive diagnosis.

TMJ arthroscopy (Bonacci *et al.*, 1996; Farole *et al.*, 1991; Takaku *et al.*, 2001) is seldom performed due to invasiveness of the examination. Arthroscopic synovial biopsy with TMJ rinsed with saline and Ringer's solution helps with defining whether cyst cavity communicates with joint cavity (Bonacci *et al.*, 1996). This method might be helpful in taking samples for histopathologic examination.

Histopathologic examination is the most reliable tool to give a definitive diagnosis (Levarek *et al.*, 2016). Fine-needle biopsy and (Deng *et al.*, 2010; Savolainen *et al.*, 2013; Silva *et al.*, 2005; Spinzia *et al.*, 2011; Vera-Sirera *et al.*, 2013) intrasurgical histopathologic examination are used in this case. In synovial cysts there are synoviocytes which do not appear in pseudocyst's capsule (Bonacci *et al.*, 1996; Farole *et al.*, 1991; Partridge *et al.*, 2016).

Conclusions

Our treatment of choice would be a complete, surgical cyst excision. In case of difficulties due to location of the cyst, we suggest fragmental cyst excision. In literature, there were some cases of incomplete incision of lesions or injecting hydrocortisone into the cyst in order to decrease inflammation and secretion of synovial cells (Heng-Kun *et al.*, 2014; Silva *et al.*, 2005; Spinzia *et al.*, 2011.) The overall prognosis is good (Spinzia *et al.*, 2011). Each patient with swelling or pain in the TMJ area should be reffered to a maxillofacial surgeon.

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