



Ganglion and Synovial Cyst of the Temporomandibular Joint: A Case Report and Literature Review

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Summary: Ganglion and synovial cysts of the temporomandibular joint (TMJ) are rare. Although histopathological findings differ, clinical presentation is comparable. This study adds a case report of a ganglion of the TMJ to existing literature and a review of all available case reports on ganglion and synovial cysts of the TMJ. Including our own case report, we reviewed 49 cases of ganglion and synovial cysts of the TMJ. They occurred in a female:male ratio of 3:1, at an median age of 46 years (range, 11–64 years). Patients mainly presented with preauricular swelling and pain. After imaging, the ganglion or synovial cyst was most commonly excised under general anesthesia. No recurrences were described. (*Plast Reconstr Surg Glob Open* 2015;3:e524; doi: 10.1097/GOX.0000000000000494; Published online 23 September 2015.)

Ganglion and synovial cysts are expansile, fluid-filled lesions of the joints mainly located in the periarticular areas of wrists, knees, and feet.¹ They rarely occur in the region of the temporomandibular joint (TMJ), where they most commonly cause preauricular swelling and pain. We present a case report of a patient with a ganglion of the TMJ and a review of the literature on ganglion and synovial cysts of the TMJ.

CASE REPORT

A 48-year-old woman was referred to our plastic surgery outpatient clinic by her general practitioner.

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She complained of a moderately painful preauricular swelling that had existed for several months and had varied in size. Her medical history mentioned only arthrosis of her right knee. On physical examination, she had a small, mobile preauricular swelling on the right side. Ultrasound examination had already been performed at request of the patient's general practitioner, revealing a hypoechoic lesion of 1.1-cm suspect for a cyst. On suspicion of a sebaceous cyst, the lesion was explored under local anesthesia. During the procedure, the lesion ruptured and released a clear mucinous fluid. A 0.8×0.6×0.2 cm lesion was excised with the clinical suspicion of a ganglion. Histopathological examination revealed a fibroadipose tissue fragment containing a cavity with a fibrous wall including local myxoid changes. This confirmed the diagnosis of a TMJ ganglion.

LITERATURE REVIEW

Methods

We conducted a literature review using the PubMed database to identify studies and case

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reports on ganglion and/or synovial cysts of the TMJ from inception to June 1, 2014. Keywords used were Synovial Cyst OR Ganglion Cyst AND Temporomandibular Joint. The search strategy generated 54 papers of which 44 studies were retrieved for full-text review based on title and abstract. Nine studies were excluded because they were not written in English and/or the subject of the study did not seem to be about a ganglion or synovial cyst from the TMJ. All included studies are case reports (Table 1).

Ganglion and Synovial Cysts

Including our own case report, we found 45 studies describing 33 cases of ganglion cysts and 13 cases of synovial cysts of the TMJ. Of all cases of a ganglion, 69% (24 of 35) were females and the median age at presentation was 46 years (range, 11–64 years). Synovial cysts occurred in females in 62% (8 of 13) and the median age at presentation was 46 years (range, 20–63 years). They were presented at an oral and maxillofacial surgeon ($n = 32$), plastic surgeon ($n = 8$), otolaryngologist ($n = 5$), neurologist ($n = 1$), neurosurgeon ($n = 1$), general surgeon ($n = 1$), or geneticist ($n = 1$). The patient's medical history was mentioned in 23 cases and was described as unremarkable in 6 cases and healthy in 5 cases. Other mentioned medical conditions were hypertension ($n = 2$), thyroid cancer ($n = 1$), hypothyroidism ($n = 1$), migraine ($n = 1$), arthritis ($n = 1$), arthrosis ($n = 1$), multiple recurrent ganglion cysts ($n = 1$), dyslipidemia ($n = 1$), cholecystectomy ($n = 1$), kidney transplant secondary to streptococcal glomerulonephritis ($n = 1$), osteoporosis ($n = 1$), TMJ syndrome following dislocation ($n = 1$), and TMJ dysfunction ($n = 1$). Blunt trauma of the affected condyle was described in 3 cases of synovial cyst. The trauma had occurred 3 days, 4 months, and 1 year before symptoms of the synovial cyst.^{2–4} In 1 patient with a ganglion, a trauma was described that had occurred 10 years before presentation of the ganglion.⁵ In another case, a trauma was reported but pathologic findings were not reported.⁶ In 10 cases trauma was denied, and in 35 cases the occurrence of trauma was not described. The main symptoms of a ganglion were swelling (67%) and pain (50%). Patients also experienced various other symptoms (34%). Main symptoms of a synovial cyst were pain (85%) and swelling (62%). Also fewer patients experienced various other symptoms (31%). Various other symptoms reported for ganglion and synovial cysts were neuralgic pain, pain aggravated by TMJ movements (mouth opening or closing, chewing), pain when waking up, numbness, paresthesia, difficulties in masticating, limited mouth opening, clicking or noise, popping sensa-

tion during TMJ movements, and acute facial palsy. Symptoms were present from 2 weeks to 5 years before presentation. Progressive growth was described in 10 cases and a varying size in 4 cases. Three patients with a ganglion presented with an external auditory canal mass with associated symptoms of aural fullness, hearing loss, intermittent bloody otorrhea, and frequent ear infections.^{7–9} Physical examination often revealed a smooth to firm, well-circumscribed palpable mass tender to palpation. The mass was either described as mobile or fixed to the underlying structures. A dental panoramic x-ray was performed in 18 cases, which demonstrated abnormalities only in 3 cases. The abnormalities were described as an ovoid lucency adjacent to the TMJ,¹⁰ a contour defect in the lateral aspect of the condyle¹¹ and condylar erosion.¹² A computed tomography (CT) was performed in 22 cases and a magnetic resonance imaging (MRI) in 23 cases. Ultrasound was performed in 6 cases^{11,13–16} and in 3 cases an additional MRI was also performed to identify the relationship of the cyst with its surrounding structures. In all but 3 cases, the cyst was excised under general anesthesia by a preauricular incision. The cyst was excised under local anesthesia in 3 cases^{6,17} including our own case report. Histopathological examination demonstrated a ganglion in 67% ($n = 33$) and synovial cyst in 27% ($n = 13$). Histopathological findings were not described in 6% ($n = 3$). Follow-up was described in 25 cases with a median follow-up of 1 year (range, 3 months–4 years) and no recurrence of symptoms was described.

DISCUSSION

In this study, we report a case of a patient who presented at our plastic surgery outpatient clinic with a clinical and radiological suspicion of a sebaceous cyst, which was determined to be a ganglion of the TMJ after histopathological examination.

This literature review demonstrates that ganglion and synovial cysts of the TMJ mainly present with swelling and pain in the preauricular region. Various other symptoms can also be present. Furthermore, it demonstrates that both ganglion and synovial cysts occur in a female:male ratio of 3:1, at a median age of 46 years. There was no trend observed in medical history.

Ganglion and synovial cysts are similar in clinical and radiological presentation, but they can be distinguished by histopathological findings. A ganglion cyst is lined by dense connective tissue and does not connect with a joint's cavity. A synovial cyst is lined by an endothelium with synoviocytes and may or may not connect with a joint's cavity.^{18,19}

Table 1. Cases of Ganglion Cysts and Synovial Cysts Reported in Literature

	Year	Sex	Age	Clinical Presentation				Duration	Growth	Imaging*	Histopathology
				Swelling	Pain	Other					
Steen	2014	Female	48	+	+	-	3 months	Varying size	US	Ganglion	
Ansari et al ²³	2013	Female	63	-	-	+	2 months		MRI	Synovial cyst	
Lee et al ⁷	2013	Male	50	+	+	+	5 months	No	CT	Ganglion	
Savolainen and Kellokoski ²²	2013	Female	56	+	+	+	6 months	Yes	MRI, CT	Ganglion	
Vera-Sierra et al ¹⁹	2013	Female	48	+	+	-	5 years	Varying size	CT	Synovial cyst	
Sulhr and Mager ⁵	2013	Male	30	+	+	-			MRI	Ganglion	
Okochi et al ²¹	2012	Female	59	-	+	-			MRI	Ganglion	
		Male	40	-	+	-			MRI	Ganglion	
		Male	59	+	+	-			MRI	Ganglion	
		Male	31	+	+	-			MRI	Synovial cyst	
		Female	20	+	+	-			MRI	Synovial cyst	
		Female	26	-	+	-			MRI	Ganglion	
Mumert et al ²⁴	2012	Female	63	-	+	+	2 months	Yes	MRI	Ganglion	
Yang et al ¹³	2011	Female	58	+	+	-	3 months	Yes	CT	Synovial cyst	
Wu et al ²⁵	2011	Female	59	+	-	-	1 year	Yes	CT	Ganglion	
Spinzia et al ¹⁴	2011	Female	45	-	-	-		Yes	CT	Synovial cyst	
Khachi et al ⁸	2011	Male	56	-	-	+			CT	Ganglion	
Neis	2010	Male	57	-	-	+			CT, MRI	Synovial cyst	
Deng et al ²⁶	2009	Female	45	-	-	-	3 months		CT	Ganglion	
Lima et al ¹⁰	2009	Female	12	+	+	+			CT, MRI	Ganglion	
Shinawi et al ²⁷	2007	Male	11	-	-	-			MRI	Not Mentioned	
Ali et al ²⁰	2006	Female	28	+	+	-	1 month		MRI	Ganglion	
Kerawala ²⁸	2006	Male	52	+	-	-	3 months	Yes	MRI	Ganglion	
Silva et al ²⁹	2005	Female	51	+	+	-			MRI	Ganglion	
Kim et al ³⁰	2003	Female	34	-	-	-	6 months		MRI	Ganglion	
Takaku et al ³¹	2001	Female	50	+	+	+	1 year	Yes	MRI	Ganglion	
Lomeo et al ³²	2000	Female	47	+	+	-	3 months		CT	Synovial cyst	
Albright et al ⁹	2000	Female	51	-	-	+	1 month		CT, MRI	Ganglion	
Nahireli et al ¹¹	2000	Female	57	+	-	-	1 year	Yes	US, MRI	Ganglion	
Goudot et al ³³	1999	Male	35	+	+	-	2 months		CT, MRI	Ganglion	
Bridgeman et al ³⁴	1998	Male	56	-	+	+	2 weeks		CT	Ganglion	
Chang et al ²	1997	Female	32	+	+	-	2 weeks		CT	Synovial cyst	
		Male	38	+	+	-	4 months		CT	Synovial cyst	
Bonacci et al ¹⁵	1996	Man	46	+	+	+	10 months	Yes	MRI, US	Synovial cyst	
Lopes et al ¹⁶	1994	Female	33	+	+	+	2 weeks		US	Synovial cyst	
Hopper and Banks ³⁵	1991	Female	58	+	+	-	2 weeks	Varying size	CT	Ganglion	
Tom et al ³⁶	1991	Male	22	+	+	-	Few months		CT	Ganglion	
Farole and Johnson ³⁷	1991	Male	22	+	-	-	Few months		MRI	Ganglion	
Tom et al ³⁸	1990	Male	22	+	-	-	Few months		MRI, CT	Ganglion	
Gray ⁶	1989	Female	34	+	-	-	1.5 years		CT	Ganglion	
El-Massry and Bailey ³⁹	1989	Female	33	+	-	-	6 months		X-ray	ND	
Singer ⁴⁰	1988	ND	ND	+	-	-			None	ND	
Copeland and Douglas ⁴¹	1988	Female	60	+	-	+	6 months		None	Ganglion	
Shiba et al ¹⁷	1987	Male	28	+	+	+	2 weeks		CT	Ganglion	
Kenny et al ¹²	1987	Female	64	-	+	-	2 weeks	No	X-ray	Ganglion	
Reychler et al ³	1983	Female	30	+	-	-	4 months	Yes	X-ray	Synovial cyst	
Kinkead et al ⁴²	1981	Female	36	+	+	+	3 weeks		X-ray	Synovial cyst	
Patel et al ⁴³	1979	Female	45	+	+	-	1 year	Yes	X-ray	Ganglion	
Ethel ⁴⁴	1979	Female	28	+	+	-	6 months		None	Ganglion	
Janecka and Conley ⁴	1978	Male	50	-	+	-			None	Synovial cyst	
Heydt ⁴⁵	1977	Female	47	+	-	-	8 months		X-ray	Ganglion	

Studies by Tom et al,³⁶ Farole and Johnson,³⁷ and Tom et al³⁸ report the same case. *X-ray was described here only if performed without further imaging like CT or MRI. CT, Computed Tomography; MRI, Magnetic Resonance Imaging; US, Ultrasound.

The differential diagnosis of preauricular swelling and pain includes parotid gland neoplasms, sebaceous cyst, retention cyst of the parotid, benign cervical lymphoepithelial cyst, benign vascular or neural mass, synovial chondromatosis, osteochondroma, osteoma, osteoblastoma, aneurysmal bone cyst, hemangioma, and sarcoma.¹⁸

It is assumed that synovial cysts are associated with trauma.²⁰ In this literature review, we found that trauma preceded the development of a synovial cyst in 23% of cases²⁻⁴ versus 3% in a ganglion.⁵ However, the occurrence of trauma was not mentioned nor denied in 35 cases.

This review demonstrates that panoramic and plain radiographs fail to demonstrate a ganglion or synovial cyst of the TMJ. Ultrasound can be helpful in ruling out parotid gland involvement.¹⁶ CT is helpful mainly for the fact that it demonstrates the relationship of the lesion with the TMJ.¹⁷ MRI is assumed to both reveal the anatomic relationships of the lesion and differentiate among a ganglion, synovial cyst, or a parotid gland lesion.^{21,22}

Treatment involves complete surgical removal, preserving adjacent structures like the facial nerve and parotid gland. In most cases, the lesion was excised under general anesthesia by a preauricular approach. The lesion was excised under local anesthesia in only 2 cases.^{6,17} In our patient's case, we did not experience any problems in performing excision of the ganglion under local anesthesia.

Although a ganglion is known generally for its recurring character, this review demonstrates that in all cases of ganglion and synovial cysts of the TMJ, no recurrences have been described. Despite the fact that follow-up was described in just 25 of 49 cases, with the shortest follow-up being only 3 months, this remains a remarkable finding. Given this fact, it has been suggested that ganglion and synovial cysts of the TMJ may be developmental in origin.¹⁰

This article adds one more case to the literature of the rarely occurring ganglion of the TMJ in addition to a literature review of all available case reports on ganglion and synovial cysts of the TMJ.

CONCLUSIONS

Although most often referred to an oral and maxillofacial surgeon, a patient with a preauricular swelling and pain might be referred to the outpatient clinic of any surgeon who has experience in surgery of the face. A ganglion or synovial cyst of the TMJ is a rare finding. The typical patient is a middle-aged woman with a preauricular swelling. In a patient with these symptoms, MRI, CT scan, and ultrasound investigation can be performed to analyze the type of

lesion present. Ganglion and synovial cysts can be safely excised under local anesthesia, but most surgeons prefer general anesthesia. Patients can be told that recurrence rates are probably low because no recurrences have been reported. Follow-up or evaluation of arthritis and/or osteoarthritis does not seem necessary as the ganglion or synovial cyst is probably developmental in origin.

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