Peritonsillar abscess due to temporomandibular joint septic arthritis: an uncommon cause of a common disease

Neha Thakur,1 Sarita Negi,2 Jagdeep S Thakur,3 Ripu Daman Arora4

SUMMARY
Peritonsillar abscess is a common presentation of complicated acute tonsillitis. The temporomandibular joint septic arthritis is an uncommon clinical entity while its complications are further rare. We present a case of a man in his late 30s who presented with a painful swelling in the left preauricular region along with increasing trismus. A diagnosis of peritonsillar abscess due to septic arthritis was made based on clinical history and examination. Patient recovered fully after antibiotic and abscess drainage. This is the first case report of temporomandibular septic arthritis leading to peritonsillar abscess.

BACKGROUND
Peritonsillar abscess is a sequel of acute tonsillitis and usually seen in adults.1 The infection spread to peritonsillar space through tonsillar crypts leading to inflammation and abscess formation. The clinical features include history of tonsillitis, odynophagia, drooling saliva and trismus. An inflamed peritonsillar area and soft palate are the cardinal clinical signs. This abscess can spread to parapharyngeal space leading to risk of airway obstruction and septicaemia.3

Septic arthritis of temporomandibular joint (TMJ) is rare. Local trauma and infection like otitis externa and parotitis are the common aetiological factors while haematogeneric spread from distant site has also been implicated. Staphylococcus aureus, Streptococcus, Haemophilus influenzae, Pseudomonas aeruginosa and Neisseria gonorrhoea are the most common organisms responsible for this rare pathology. However, aetiology remains unknown in majority of the cases.2,3 Majority of these cases respond to treatment but distant spread can occur rarely depending on the general condition of the host and virulence. Unusual spread has been found in the deep neck spaces, epidural space and cerebrum.4–6

It is very unusual to find abscess spreading from other head and neck spaces to peritonsillary space. Here, we present the first case report of peritonsillary abscess after septic arthritis of TMJ.

CASE PRESENTATION
A man in his late 30s is presented with fever, painful swallowing and inability to open mouth for last 3 days. A detailed history revealed that patient suffered pain in the left preauricular area during chewing movement last week. He visited dental outpatient department and diagnosed with internal derangement of left TMJ and advised oral amoxyclavunate and analgesics. However, 4 days later, he developed severe trismus, and progressive swelling and pain. He was started on parental amoxyclavunate and analgesic. An orthopantogram found anterior dislocation of left TMJ. Three days later, patient had swelling in parotid and temporal area for which he was referred for ear, nose, throat (ENT) consultation.

The examination found grade 1 trismus, oedematous and congested anterior tonsillar pillar and soft palate on left side. Left tonsil and uvula were pushed medially. There was another mild diffuse, tender, non-fluctuant swelling in the left parotid region. The jaw movements were painful. Further examination did not reveal any significant finding. A probable diagnosis of peritonsillar abscess with parotitis was made and patient subjected to further investigations.

INVESTIGATIONS
A contrast-enhanced CT revealed a heterogeneously enhancing lesion with faint peripheral enhancement in left masticator, parotid and TMJ spaces causing its widening and anterior and lateral dislocation of condylar process of mandible, suggestive of an evolving abscess (figure 1). MRI (figures 2 and 3) revealed an altered signal intensity area in the left masticator, pterygoid, parotid and parapharyngeal spaces with bulge in the left tonsillar area. This lesion was heterogeneously hypointense on T2 with peripheral postcontrast enhancement and central non-enhancing areas. This enhancement was continued up to left TMJ with slight lateral dislocation of the condyle. Haematological and biochemical investigations were normal except for an elevated total leucocyte count (18.0 x 109/L).

DIFFERENTIAL DIAGNOSIS
The clinical features and investigations were in favour of septic arthritis of TMJ with abscess of various head and neck spaces as mentioned earlier. The diagnosis of acute peritonsillar abscess is straightforward on clinical examination and usually does not require any radiological investigation. Similarly, acute parotitis also does not require any radiology. It is rare to find acute parotitis and acute peritonsillar abscess simultaneously. Immuno-compromised state should be checked in such cases while CT and/or MRI should be done to assess abscess in deep neck abscess. Malignancies

1 ENT, Regional Hospital, Bilaspur, HP, India
2 ENT, Dr YSP Government Medical College, Nahan, Sirmour, HP, India
3 Otolaryngology-Head and Neck Surgery (ENT), Indira Gandhi Medical College, Shimla, HP, India
4 Otolaryngology-Head and Neck Surgery (ENT), AIIMS, Raipur, CG, India

Correspondence to
Dr Ripu Daman Arora; ripu.arora@aiimsraipur.edu.in
(leukaemia and extranodal lymphoma) with secondary infection can also present similarly.

**TREATMENT**

The patient was started with intravenous antibiotics (cefipime and ornidazole) and anti-inflammatory drugs (diclofenac and paracetamol). The mouth opening improved with medication that allowed better view of oropharynx. An incision and drainage of the left peritonsillar abscess was performed. The pus culture did not show any microorganism growth after 48 hours of incubation. Intravenous antibiotics were continued for a week with repetitive dilatation of incision site. Patient was discharged 1 week after significant improvement.

**OUTCOME AND FOLLOW-UP**

Two days after discharge, patient came with discharged in the left ear. Examination found purulent discharge coming from the floor of external ear canal (EAC). Tympanic membrane was normal and intact. About 1 mL of pus was drained with dilatation of the pus point which appeared to be from TMJ. Pus culture revealed *Klebsiella pneumoniae* sensitive to ciprofloxacin, cotrimoxazole, cefotaxime, ceftazim and imipenem. Patient was infused with ciprofloxacin for 2 days and switched to oral formulation for 5 more days. Follow-up after 2 weeks found complete resolution of the clinical features. Patient was referred to dental OPD for further treatment where he was advised physiotherapy and regular follow-up.

**DISCUSSION**

Peritonsillar abscess, also known as quinsy, is a localised collection of pus in peritonsillar space between the tonsillar capsule and superior constrictor muscle. It is the most common deep neck space abscess managed by otolaryngologist.1 Peritonsillar abscess is usually seen in adolescent with male preponderance.7 The clinical features include odynophagia, muffled voice and fever. Trismus can occur in advanced stage when it extends beyond peritonsillar space. Antibiotics with needle aspiration or incision drainage is the treatment of choice.1

Septic arthritis of the TMJ is rare. It usually follows trauma, local and haematogenic infection while majority of time aetiology remains unknown.2 3  Septic arthritis has been reported after tonsillitis, otitis media and otitis externa.8–10

Septic arthritis of the TMJ usually presents with fever, pain and swelling around the joint along with restricted jaw movements. The causative microorganisms include anaerobes as well as both gram positive and negative aerobes. CT is the investigation of choice, but MRI is more sensitive especially in early phase.1 The treatment is incision and drainage of the abscess or needle aspiration along with broad spectrum intravenous antibiotics till microbial culture and drug sensitivity is available. It needs aggressive treatment to avoid morbidity and fatal complications.9

Locoregional abscess formation is an unusual complication of septic arthritis. To our best of knowledge, this is the first case report of the septic arthritis of TMJ presenting with peritonsillar abscess. Gayle et al has reported such unusual complication with involvement of masseteric and pterygomandibular spaces with extension to the left deep temporal region and the
skull base.\textsuperscript{4} Wittig \textit{et al} has reported a case of epidural abscess after septic arthritis of temporomandibular abscess which was managed by craniotomy and drainage.\textsuperscript{3} Døving \textit{et al} reported cerebral abscess and Lemierre’s syndrome in a man in his early 70s and managed successfully with aggressive treatment.\textsuperscript{6} They found necrotic tissue in masseter muscle, temporal muscle, and pterygopalatine and infratemporal fossa. Cerebral abscess and Lemierre’s syndrome was managed non-surgically.

The cervical fascia divides the neck into various spaces through its deep and superficial layers. These spaces are closely located and communicates with each other. The parapharyngeal space is one of the largest neck spaces extending from base of skull to hyoid. It is bounded by buccopharyngeal fascia medially and parotid laterally. It communicates with smaller neck spaces like masseteric, parotid, peritonsillar, submandibular and retropharyngeal spaces directly while mediastinal communication is through its contents like carotids, internal jugular vein and vagus nerves.

The cervical fascia carries lymphatic channels and act as disease barrier. However, highly virulent microbes or an immuno-compromised state exploits these fascial planes to act as easy pathway for the spread of infection to other spaces and finally complications. The parapharyngeal abscess commonly involves masseteric and parotid spaces and vice versa.

The clinical presentation of present case can be explained on these anatomical correlations. Further, the TMJ has very close proximity to the parapharyngeal, masseteric and parotid space and hence its infection can easily spread to these spaces. As stated earlier, the buccopharyngeal fascia forms the medial boundary of the parapharyngeal space and hence this fascia commonly gets inflamed during parapharyngeal infection. As we know, buccopharyngeal fascia together with pharyngeal muscles forms the floor of the tonsil and hence large parapharyngeal abscess presents with medial displacement of tonsil beside the common features of trismus and neck swelling. Authors have observed in their clinical practice that sometimes/rarely parapharyngeal abscess presents more medially in oropharynx than neck and can be drained through tonsillar approach. On these considerations, we can infer that our patient had septic arthritis due to the TMJ injury during chewing that spread to other spaces due to the close proximity and communications between them as stated above. This patient did not have any aetiological factor for development of septic arthritis while other laboratory investigations were normal, still patient developed parapharyngeal abscess and presented with peritonsillar abscess rather than usual cervical presentation, which is quite rare but explainable on anatomical proximity.

In conclusion, this case report emphasises on prompt management of septic arthritis of TMJ and neck abscesses. A CT or an MRI scan with appropriate antibiotics and surgical drainage should be performed so as to avoid further complications.

\textbf{Contributors} Certified that following authors have contributed in this case report titled “Temporomandibular joint septic arthritis leading to peritonsillar abscess: an uncommon cause to a common disease”. NT and SN was responsible for conception, methodology, data collection, drafting. JT was responsible for conception, data analysis and final draft. RDA was responsible for draft and critical revision. All authors have read and approved the final draft for submission.

\textbf{Funding} The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

\textbf{Competing interests} None declared.

\textbf{Patient consent for publication} Consent obtained directly from patient(s).

\textbf{Provenance and peer review} Not commissioned; externally peer reviewed.

\textbf{ORCID IDs} Jagdeep S Thakur http://orcid.org/0000-0003-2311-0571

\textbf{Ripu Daman Arora} http://orcid.org/0000-0003-0522-3118

\section*{REFERENCES}