Bilateral Intratonsillar Abscesses: A Deceiving Symmetrical Oral Bulging

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ABSTRACT **Background:** Unilateral intratonsillar abscess (ITA) is an underreported, well-known complication of acute tonsillitis. The prevalence of unilateral ITA compared to peritonsillar abscess (PTA) is 1:14. However, bilateral ITA is an extremely rare entity, with only four cases reported thus far.

Objectives: To describe past cases and our experience, elaborating the diagnostic challenge and the surgical treatment for bilateral ITA.

Methods: We conducted a literature search in the PubMed database using the key words *intra-tonsillar abscess, tonsillar abscess, bilateral tonsillar abscess, bilateral intra-tonsillar abscess* and *bilateral peritonsillar abscess.* Our search was limited to the years 1980 to 2020.

Results: We found that only four cases of bilateral ITA were previously published. All were characterized by a delay in diagnosis with a median of 10 days (4–14 days), symmetrical oral cavity appearance, enlarged bilateral kissing tonsils, and subsequent treatment by surgical drainage/paracentesis. Respiratory compromise was a concern in most cases. Our patient was treated with bilateral quinsy tonsillectomy and had a prompt recovery.

Conclusions: Bilateral ITA is a rare, deceiving entity, with a diagnosis delay attributed to the symmetrical oral bulging. We present the fifth case reported and the first ever reported in a pediatric patient. We describe the assumed pathogenesis and the main characteristics among all five patients, emphasizing the important role of a high index of suspicion and appropriate imaging, guiding to proper diagnosis and treatment.

IMAJ 2023; 25: 39–41

KEY WORDS: computed tomography scan (CT scan), intratonsillar abscess (ITA), peritonsillar abscess, tonsillar abscess, ultrasound

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Intratonsillar abscess (ITA) is an infrequent, yet well-known complication of acute tonsillitis, with a paucity of data retrieved from small case series [1-3]. Two cross-sectional analyses published in 2018 and 2019, both by Ali et al., reported a ratio of peritonsillar to unilateral intratonsillar abscess of 14:1 in adults [4] and 10:1 in the pediatric population [5]. The authors suggested that ITA was being underreported.

Two different potential routes for the development of ITA have been proposed: a direct tonsillar crypt bacterial penetration and a bloodstream / lymphatic seeding [1,6]. In contract to a unilateral ITA, the development of bilateral ITA is an exceptional, rare clinical entity, which is much less recognized by treating physicians [3,7-9]. We reviewed and analyzed the previously published cases and present the first case of bilateral ITA in a young pediatric patient.

The purpose of our study was to review the demographics, clinical presentation and course of disease, laboratory, and imaging findings, and to review treatment options for bilateral ITA.

PATIENTS AND METHODS

The study was approved and conducted according to the guidelines of the local internal review board (Helsinki Committee).

A literature search of English language articles included in the PubMed database was conducted using the key words *intra-tonsillar abscess*, *tonsillar abscess*, *bilateral tonsillar abscess*, *bilateral intra-tonsillar abscess*, and *bilateral peritonsillar abscess*, and published between the years 1980–2020. Two investigators (M.O. and N.H.) independently reviewed all relevant studies.

RESULTS

Overall, we found four cases of bilateral ITA: three case reports [7-9] and a fourth patient retrieved from a case series [3] [Table 1]. We described the data of two males and three females included in the four published cases plus our patient. Two patients had substantial co-morbidities: diabetes mellitus with end organ complications (patient 2) and Angelman syndrome (patient 4). Only one patient (patient 2) had a clinical history suggesting recurrent throat infections. All patients presented with odynophagia and fever. The time to proper diagnosis ranged from 4 to 14 days (the median diagnosis delay was 10 days).

On physical examination, all patients presented with grade-IV symmetric tonsils. All except patient 5 had trismus. Patient 3 presented with moderate airway obstruction, and patient 4 required urgent intubation. Blood test of all patients demonstrated high inflammatory markers.

All patients underwent contrast-enhanced computed tomography (CT) scan leading to surgical intervention (needle aspiration,

Table 1. Patients' demographic, clinical presentation, laboratory findings, treatment modality and culture results

Patient number (ref)	Age (years)	Sex	Diagnosis delay diagnosis (days)	Physical examination	White blood cell count	Surgical treatment	Tissue/pus culture results
1 [9]	19	Female	6	Trismus, Grade IV symmetric tonsils	N/A	Needle aspiration	Nil
2 [7]	42	Male	4	Trismus, symmetric kissing tonsils, muffled voice, stridor	42×10^9/L	Bilateral tonsillectomy	*Enterobacter cloaca*, MRSA
3 [8]	42	Male	14	Trismus, stridor, airway obstruction, Grade IV symmetric tonsils	19.2×10^9/L	Needle aspiration	Group A streptococcus, Gram negative rods
4 [3]	15	Female	N/A	Trismus, airway obstruction, Grade IV symmetric tonsils	N/A	Tonsillar surgical drainage	N/A
5	6	Female	14	Kissing tonsils	35×10^9/L	Bilateral tonsillectomy	Group A streptococcus

MRSA = Methicillin resistant *Staphylococcus aureus*, N/A= not applicable

surgical drainage, or tonsillectomy) followed by intravenous (IV) antibiotics with rapid recovery following the surgical treatment. Patient 5 was the only one who was diagnosed sonographically.

Our patient was the youngest patient (6 years old) with bilateral ITA. The patient did not improve despite an adequate dosage of 2 weeks oral amoxicillin-clavulonate treatment. On physical examination the patient presented with pyrexia (39.2°C), tachycardia (heart rate was 155 per minute), bilateral enlarged grade-IV exudative palatine tonsils (kissing tonsils) with a centralized uvula and symmetric pharynx, with no asymmetry in fiberoptic direct laryngoscopy. She had neither respiratory discomfort nor stridor, neither trismus nor torticollis. Laboratory test demonstrated a left shift leukocytosis (36×10^9 /L, 90% neutrophils), high CRP (16.5 mg/dl). Due to the prolonged clinical course, we performed a neck sonographic examination, which demonstrated bilateral ITA [Figure 1]. The diagnosis was confirmed by a subsequent contrast-enhanced CT scan that clearly demonstrated bilateral ITA measuring $2.4 \times 2 \times 2.1$ cm and $1.5 \times 1.6 \times 2.1$ cm [Figure 2]. Surgery was performed under general anesthesia. A bilateral needle aspiration of 5 ml pus was extracted from each tonsil followed by bilateral tonsillectomy. Culture demonstrated penicillin sensitive Group A streptococcus. Unremarkable reactive lymphoid tissue was found on the histopathologic investigation of the tonsillar tissue.

DISCUSSION

We examined the clinical characteristics and management of five patients with bilateral ITA. The main complaints were pyrexia, odynophagia, and non-resolving symptoms with an associated delay in the diagnosis attributed to the symmetrical bilateral grade-IV tonsils. All patients had contrast-enhanced CT scans followed by surgical treatment with a rapid, complete recovery. Patient 5 was the only one in whom the diagnosis was first suggested by sonography.

In contrast to bilateral ITA, more is known about unilateral ITA, which is clinically not as common as peritonsillar abscess (PTA). Unilateral ITA has been investigated by different research groups [1,4,5,14] using radiologic imaging and histological analysis. Histological identification of unilateral ITA

Figure 1. Grey-scale sonography **[A]** of the submandibular region in a transverse oblique view showing a hypo-echoic round lesion (*) in the posterior aspect of the left tonsil (T). Color interrogation **[B]** showed no flow within this finding, consistent with a fluid collection. S: submandibular salivary gland. A similar mirror image finding was seen on the right side

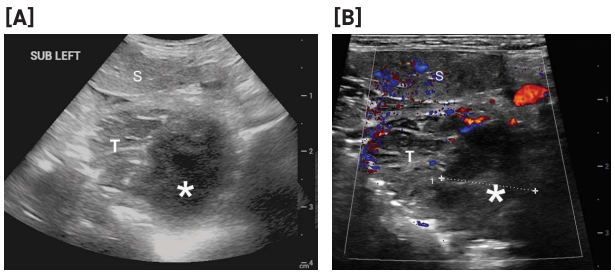
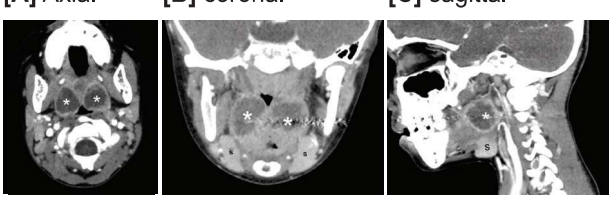


Figure 2. Contrast-enhanced computed tomography scan of the neck showing the bilateral, symmetric intratonsillar collections (*). S: submandibular salivary gland



following quinsy tonsillectomy is far more common and was initially described by Childs and colleagues [1]. A unilateral ITA was demonstrated in as many as 16% of histological specimens excised from peritonsillar abscesses. The authors found worse trismus and uvular deviation with less voice changes in unilateral ITA compared to PTA cases.

Investigating the prevalence (mostly by imaging) of unilateral ITA (compared to PTA cases) revealed that 31 cases (9%) in the pediatric population [5] and 43 cases (7%) in the adult group of patients [4] demonstrated unilateral ITA. In both groups of patients, as many as 90% of radiologically proven unilateral ITA resolved without surgical intervention. In a different case series (n=11) of unilateral ITA in the pediatric population [3], all had ITA with parapharyngeal or retropharyngeal infection/abscess seen on imaging. One patient had bilateral ITA and included in our analysis. The average volume of the ITA was 1.85 cm^3 (range 0.99–3.82 cm^3) and only four patients underwent surgical intervention.

There are two accepted theories for ITA formation based on different histopathology findings: a focal abscess because of direct bacterial extension from a tonsillar crypt or multiple scattered areas of necrosis secondary to bacterial seeding via blood or lymphatic flow. Blair and associates [6] argued for the lymphatic spread theory, since lymphatic flow reduction (caused by PTA, parapharyngeal inflammation, or dehydration) may be the reason for bacterial accumulation inside the tonsil parenchyma leading to ITA formation.

In bilateral ITA, the lack of symptom localization (ipsilateral otalgia, neck pain) and the lack of overt findings on physical examination, make the diagnosis challenging, as symmetrically large tonsils are common in most patients with follicular tonsillitis. We found a prolonged diagnosis delay (median delay of 10 days). The lack of symptom localization was highlighted as a cause for delay of diagnosis also in bilateral PTA, as mentioned by Kessler and co-authors [15].

All patients with bilateral ITA were surgically treated, either by needle aspiration (patients 1 and 3) or surgical drainage in the operating room (patients 2, 4, and 5).

CONCLUSIONS

Bilateral ITA is a rare clinical entity. The diagnosis may be difficult considering the symmetrical appearance of the oral cavity and oropharynx. A high index of suspicion and appropriate imaging investigation by sonography and/or CT scan are crucial in these rare cases. Surgical intervention, followed by IV antibiotic treatment is mandatory.

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The lights of stars that were extinguished ages ago still reach us.
So it is with great men who died centuries ago, but still reach us with the radiations of their personalities.
Kahlil Gibran (1883–1931), Lebanese–American poet and artist

Still round the corner there may wait, / a new road or a secret gate.
J.R.R. Tolkien (1892–1973), English writer, poet, philologist, and academic, best known as the author of the high fantasy works *The Hobbit* and *The Lord of the Rings*