

Peritonsillar abscess: epidemiology, diagnosis and management

Phlegmon périamygdalien: épidémiologie, diagnostic et prise en charge thérapeutique

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ABSTRACT

Objective: Peritonsillar abscess (PTA) is defined as an accumulation of pus in between the tonsillar capsule and the superior constrictor muscle. It occurs mainly following an episode of acute tonsillitis. The purpose of this study is to determine the epidemiological and clinical features of this disease, as well as the different therapeutic modalities.

Materials and methods: This is retrospective study covering PTA cases admitted in the department over a period of 9 years, from January 2011 to December 2019.

Results: We studied a total of 95 PTA cases. PTA was mainly observed in young adults aged between 21 and 30 years old (30,5%) . It was clinically diagnosed in 94 patients. The most predominant physical findings were the following: swollen and deviated uvula (54.7 %) , trismus (64.2 %), congested anterior pillar (100 %) and a medially deviated palatine tonsil (57 %). Bilateral PTA was only recorded once. Needle aspiration was practiced in 94 patients, draining pus in 82 cases (86.31 %). All of the 95 studied patients received intravenous antibiotics. Thirteen patients (13.68 %) received medical treatment. Surgical drainage was performed in the remaining cases using needle aspiration (n=51), incision drainage (n=30) or quinsy tonsillectomy (n=1).

Conclusion: PTA is one of the most frequent ENT emergencies. The diagnosis is clinical. The treatment can be medical and/or surgical.

Key words: Peritonsillar abscess, Epidemiology, Diagnosis, Treatment

RÉSUMÉ

Objectif Le phlegmon péri-amygdalien (PPA) est défini par l'accumulation de pus dans l'espace situé entre la capsule amygdalienne et le muscle constricteur supérieur du pharynx. Il survient dans la majorité des cas après un épisode d'angine. Le but de cette étude est de déterminer les facteurs épidémiologiques et cliniques de cette maladie, et de détailler les différentes modalités thérapeutiques.

Matériels et méthodes: Il s'agit d'une étude rétrospective portant sur les cas de PPA admis dans notre département le long d'une période de 9 ans, allant de Janvier 2011 jusqu'à Décembre 2019.

Résultats: Le phlegmon périamygdalien (PPA) a été surtout observé chez les adultes jeunes âgés entre 21 et 30 ans (30,5 %). Le diagnostic a été clinique chez 94 patients. Les signes physiques les plus fréquents chez nos patients étaient: l'œdème et la déviation de la luette (54,7 %), le trismus (64,2 %), le bombement du pilier antérieur (100 %) et la déviation médiane de la tonsille palatine (57 %). On a rencontré un seul cas de PPA bilatéral. Une ponction aspiration a été pratiquée chez 94 patients, revenant productive dans 82 cas (86,31 %). La totalité des patients ont reçu une antibiothérapie par voie intraveineuse. Treize patients (13,63%) ont reçu un traitement médical. Un drainage chirurgical a été pratiqué chez le reste des patients soit à travers une ponction aspiration (n=51) une incision-drainage (n=30) ou une amygdalectomie à chaud (n=1).

Conclusion: Le phlegmon périamygdalien est l'une des plus fréquentes urgences ORL. Son diagnostic est clinique. Le traitement est médical et/ou chirurgical.

Mots clés: Phlegmon périamygdalien, Épidémiologie, Diagnostic, Traitement.

INTRODUCTION:

Peritonsillar abscess (PTA) is the most common deep neck space infections (DNSI) [1]. It is defined as an accumulation of pus in the peritonsillar space located between the capsule of the palatine tonsil and the superior pharyngeal constrictor muscle. It is frequently preceded by an episode of acute tonsillitis (AT) [1–3]. But it can be secondary to other factors such as an

infection of the Weber glands, chronic periodontal disease and smoking [3–5].

PTA is unilateral in most cases; bilateral forms are rare [2]. The diagnosis of PTA is based on physical examination and needle aspiration [4]. It can be caused by aerobic or anaerobic germs [6]. Computed tomography (CT) scan is the most sensible tool for PTA diagnosis but imagery is unnecessary in typical



presentations. PTA management is both medical and surgical [7]. PTA could lead to rare but fatal complications that mainly include retropharyngeal and parapharyngeal abscess and descending mediastinitis [8]. Distance tonsillectomy is indicated in patients with recurrent PTA [9,10]. This study aims to determine epidemiological and clinical features of PTA as well as different management methods in our ENT center and in literature.

MATERIALS AND METHODS

We conducted a retrospective study in our otorhinolaryngology head and neck surgery department that included patients with a confirmed PTA diagnosis admitted in the department over a period of 9 years starting from January 2011 to December 2019.

We included patients from all age in whom the diagnosis of a PTA was confirmed either based on the initial clinical presentation and the physical examination. We also included cases of PTA conformed using CT scan either in patients having a severe trismus or in young children in whom oropharyngeal examination was impossible. We excluded patients having a history of a tonsillectomy or pharyngeal tumor or having an incomplete medical record.

For each included patient, we reviewed the medical record, risk factors, initial symptoms, and medical treatment prior to admission. The age and the gender each patient were recorded. The month and the season of each admission were noted; and we studied whether there was a significant seasonal variation. Clinical findings particularly regarding the palatine tonsils, the uvula, the soft palate, the trismus and the oral hygiene were ascertained from each patient medical record. A needle aspiration of the peritonsillar collection was practiced; drained pus confirmed the diagnosis.

For each patient, the received medical treatment was noted. We also recorded the used surgical drainage method which consisted either of needle aspiration (NA), incision drainage or quinsy tonsillectomy [11,12]. After discharge, we studied the recurrence of both PTA and acute tonsillitis (AT).

The length of the hospitalization period and the duration of intravenous antibiotics were noted. When the C-reactive protein count was performed, the correlation between its level and the hospitalization period was analyzed. We also analyzed the correlation between the hospitalization period and different factors such as diabetes, white blood cells count.

All obtained data were collected and statistically analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. For quantitative data, we calculated frequencies, percentages, standard deviations and medians. For quantitative variables, we used the Pearson and Spearman correlations for normally distributed and not-normally distributed variables respectively. On the hand, for qualitative and quantitative variables we used either Student T test for normally distributed variables and Mann-Withney U

test in the remaining cases. A p value of < 0.05 was considered as statistically significant.

RESULTS:

A total of 95 patients diagnosed with PTA were admitted in our department in the period between January 2011 and December 2019 with an average of 10.55 cases / year. We recorded a male predominance with a sex ratio of 1.43. The median age of incidence was 32.71 years [2;64] with a significantly higher incidence in young adults aged between 21 and 30 years old ($p < 0.001$).

Autumn was associated with a slightly higher PTA incidence (32.6 %) but seasonal variations were not statistically significant ($p = 0.301$). A recurrent tonsillitis (RT) was noted in 23.2 % of the cases with a median value of 5 episodes per year [4;6]. Prior to the admission, 71.57 % of the patients ($n = 68$) received a medical treatment based on antibiotics and non-steroids anti-inflammatory drugs in respectively 60 and 37 patients. Odynophagia was the most predominant symptom amongst patients (91.6%) followed by fever (53.7 %), trismus (48.4 %) and dysphagia (41.1 %). At the physical examination, we recorded a bulge in the anterior pillar in all patients (Figure 1) with a right side predominance (62.1 %) while one case of bilateral PTA was observed. The most commonly observed findings were uvular deviation, trismus, anterior pillar swelling and an enlargement with a medial displacement of the palatine tonsil. (Table I)



Figure 1: examination of the oropharynx showing a congestion and a bulge at the left anterior pillar (white arrow).

**Table I: physical examination findings**

Physical examination findings	Percentage	Number
Trismus	64.2 %	61
Swelling of the anterior pillar	100 %	95
Uvular deviation	54.7 %	52
Medial displacement of the palatine tonsil	57 %	54
Fever	53.7 %	51
Cervical lymphadenitis	32.6 %	35
Torticolis	0.01 %	1
Drooling	10.52 %	10

Needle aspiration (NA) at the swollen pillar under local anesthesia was performed in 94 patients to confirm PTA and exclude differential diagnosis. It drained pus in 82 patients (86.31 %). Bacteriological examinations of pus aspirate were performed in 22 cases due to technical issues such as non-availability of bacteriological examination or of adequate growth plates at the local laboratory. In these patients, a germ was isolated in 4 cases: beta hemolytic streptococcus (n=3) and staphylococcus Aureus. Bacteria culture tests results did not influence management in these cases. White blood cells were elevated in 81 patients. CRP count was positive in all cases with a median value of 65.75 mmol/l [6;212]. CT scan was only performed in one patient having a severe trismus making examination impossible; it confirmed the PTA diagnosis. (Figure 2) Imaging was not required in the 8 children of our study and the diagnosis was based on the presence of anterior pillar bulging in all of them with either a spontaneous pus drainage (n=2) or a productive needle aspiration (n=2).



Figure 2: Computed tomography scan, contrast-enhanced axial slide showing a hydro-aeric collection at the level of the left tonsillar space (thin black arrow) with a central hypodensity (dashed black arrow) and a peripheral enhancement of the rim (thick black arrow).

All patients received intravenous (IV) antibiotics that included at least one of the following molecules: Amoxicillin-Clavulante, Metronidazole, Ciprofloxacin and Gentamicin. (Table II) The most used antibiotics combination was Amoxicillin-Clavulante and Metronidazole (81.05 %). (Table III) None of the patients received non steroid anti-inflammatory drug while 7.4 % received corticosteroids. Patients with an unproductive NA (13.68 %) received only medical treatment. Surgical drainage under local anesthesia was performed in 82 patients using mainly needle aspiration (62.19 %) and incision drainage (36.58 %). In many studies in the literature, needle aspiration was included amongst the surgical drainage modalities of PTA, alongside with incision-drainage and quinsy tonsillectomy [11,12] we added this detail in the material and methods section). Quinsy tonsillectomy was used for a patient admitted for the third PTA episode.

	Number	percentage
Amoxicillin-Clavulanate	93	97,9%
Metronidazole	79	83,2%
Gentamicin	4	4,2%
Ciprofloxacin	3	3,2%

Table III: the used combinations of antibiotics

	Number	Percentage
Amoxicillin-Clavulanate	12	12.63 %
Amoxicillin-Clavulanate + Metronidazole	77	81.05%
Amoxicillin-Clavulanate +Gentamycin	2	2.11 %
Amoxicillin-Clavulanate+Ciprofloxacin	1	1.05%
Amoxicillin-Clavulanat+ Metronidazole +Gentamycin	1	1.05 %
Ciprofloxacin+Gentamycin	1	1.05%
Ciprofloxacin	1	1.05 %

The duration of intravenous antibiotics during the hospitalization period varied between 3 and 4 days for 63.2% of patients. The longest hospitalization stay consisted of 9 days; it was observed in two patients presenting either a bilateral form of PTA or a prolonged trismus.

We concluded that there was a significant association between the CRP level at the admission and the LH ($p=0.022$) using the Pearson correlation. But the LH was not associated neither with the white blood cells levels at admission ($p=0.514$) nor with diabetes ($p=0.951$) or with age (0.875)

No complications were reported in our patients. After discharge, all patients received oral antibiotics. The total duration of antibiotics was 14 days for all patients. We noted 6 cases of recurrence (6.3 %). Twenty patients (20.8 %) who had either a history of recurrent tonsillitis or recurrent PTA, underwent a tonsillectomy at a later date, with a median value of 4.88 months following the admission date [2;12] months. All patients with recurrent PTA episodes underwent tonsillectomy whether immediately (n=1) or at a later date (n=5).

Discussion:

PTA is the most prevalent DNSI amongst adults and children [1,13]. All age groups can be concerned



by PTA; adolescents and young adults are the most affected group [14]. However, extreme ages are rarely affected [15,16]. Similar findings were noted in our study with young adults being the most concerned age group.

There is no clear consensus in literature about seasonal variation. Studies in Turkey, Denmark and the Czech Republic reported that seasons did not have an impact on PTA incidence [17,18]. In accordance with prior literature findings, we concluded that seasonal variations were not statistically significant as well.

Recurrent tonsillitis (RT) is one of the risk factors of PTA occurrence [18,19]. However, PTA cases in post-tonsillectomy patients were also reported [20]. Other factors can cause PTA such as Weber glands infection, smoking and chronic dental disease [1,3]. Weber glands are minor salivary glands located in soft palate above palatine tonsils [21]. Their infection may cause an obstruction of the glands that spreads to the peritonsillar space leading to abscess formation [3,21]. Smoking is also associated with higher risk of developing PTA; it is reported to increase PTA occurrence by 150 % [5]. The infection starts in most cases as an AT [1,2,22]. It spreads to the peritonsillar space progressing into a peritonsillar cellulites leading eventually to abscess formation [2,16]. PTA was preceded by an AT in 71.57 % of our cases as well.

At the time of the consultation, patients mainly present with odynophagia, fever and trismus. Drooling, dysphagia, otalgia and muffled voice are less reported [2,16,23]. The most predominant physical examination findings are: deviation of the uvula to the contralateral side, unilateral bulge at the anterior pillar, trismus and an enlarged and medially displaced palatine tonsil [16,19]. PTA is unilateral in most cases, while bilateral forms are rarely reported [1]. We noted one case of a bilateral PTA. Its prevalence varied between 1% and 3.4% in previous series [3,18,24]. The diagnosis is more challenging in bilateral forms as they are not associated with the classical asymmetries of the pharyngeal structures. Physical examination rather reveals a bilateral bulge of the anterior pillar and a centrally pushed forward uvula [1].

The diagnosis of PTA is based on physical examination and needle aspiration through the anterior pillar swelling [6]. Needle aspiration helps confirm PTA diagnosis and rule out other differential diagnosis especially peritonsillitis as differentiating between PTA and peritonsillitis can be challenging. Trismus, uvula deviation and productive NA associated with PTA are also important to make the difference between these two entities [25].

PTA is a polymicrobial infection that can be due to aerobic and anaerobic germs [14]. The most isolated germs are Group A streptococcus, most commonly β -hemolytic group, followed by staphylococcus aureus, Haemophilus influenzae and fusobacterium necrophorum [6,14,18]. However, cultivation does not always have an impact on PTA diagnosis and

management. It is rather important in the case of the absence of recovery after initial treatment [25].

Computed tomography (CT) scan is the imagery modality of choice for PTA diagnosis due to both its important specificity and sensibility; however it is not indicated in patients with a typical PTA presentation [4,7,10]. It was only performed in one of our patients due to a severe trismus. CT scan is indicated in particular cases: severe trismus making, proper examination impossible, uncooperative children, a doubtful diagnosis, the suspicion of a complication and the absence of regression after adequate treatment [7,10,26]. Transoral ultrasound is also a sensible alternative for PTA diagnosis but it remains an uncommon procedure [27].

When a PTA diagnosis is suspected, especially in patients who have already undergone a tonsillectomy, differential diagnosis need to be excluded. They include: tonsillar abscess, lymphadenitis, malignant tonsillar tumors, parapharyngeal mass, salivary gland infections and dental and gingival infections [20,28].

PTA management varies between different ENT departments; it can be medical and/or surgical. All our patients were treated as in-patients. This attitude was advocated by many authors [29]. Author physicians rather suggests treating PTA as out-patients [30].

Medical treatment is mainly based on IV antibiotics associated to hydration fluids, analgesics and steroids. The choice of antibiotics differed in literature, but chosen molecules should insure adequate coverage for both aerobic and anaerobic germs [31,32]. Penicillin, Amoxicillin-Clavulanate (AC) and Metronidazole were the molecule of choice. In cases of penicillin allergy, macrolides, 3rd generation Cephalosporin and Clindamycin could be used [6,10,33,34]. The association of AC and Metronidazole was the combination of choice in our patients. However its percentages of use varied between 10.9 % and 41 % in previous studies [4,23]. The duration of ATB and the switch to oral administration depend on the clinical response. Total antibiotics duration varies from 10 to 14 days.

Steroids are reported to help regress symptoms severity, accelerate recovery and thus reduce hospitalization stay [2,12]. Souza et al. [35] used steroids for 90 % of their patients.

Medical treatment (MT) alone could be curative in the cases of PTA with minor symptoms without associated complications [36,37]. In a recent study, Battaglia et al. [37] concluded that MT was associated with less pain, and equal efficacy especially in patients without trismus. A meta-analysis by Forner D et al. [12] found that there was no significant difference in treatment failure between patients treated with MT alone versus surgical treatment. As for our study, 13 patients (13.68%) with unproductive NA received MT only; it was associated with the resolution of symptoms in all cases.

Nevertheless, the optimal management for PTA consists of the surgical treatment of the abscess



using either methods: needle aspiration (NA), incision drainage (ID) and less frequently quinsy tonsillectomy [2,6,7]. The choice between NA and ID still presents a subject of controversies. ID is believed to be more effective as it is associated with deep dissection through infected tissues, but it is more painful and invasive in comparison with NA [2]. NA is an easier and less painful curative technique. Recurrence percentages varied between 4.9-80 % for NA in comparison with 0-20% for ID [9]. Mansour C et al. [7] noted in his study that ID was associated with a shorter hospital stay while Herzon et al. [38] reported a 96 % resolution rate using needle aspiration only. NA was used in 62.9 % of the patients in our study; it was associated with the resolution of symptoms in all cases.

Quinsy tonsillectomy is rarely performed even though it insures a full evacuation of pus. It is reserved for particular cases such as bilateral PTA, recurrent PTA, upper airway obstruction and unresponsive cases of PTA [2,9,10]. However, in their recent meta-analysis, Tsikopoulos et al. [39] concluded that quinsy tonsillectomy insures a full abscess drainage and relief of symptoms yet without increasing the risk of post tonsillectomy hemorrhage in comparison with interval tonsillectomy.

The median length of hospitalization (LH) was 3.9 days [1-9]. In agreement with a recent Turkish study, CRP levels were significantly correlated with a slower healing and a longer hospitalization stay while WBC count and diabetes did not influence the LH [17]. All of our patients recovered without complications. Complications of PTA are rare but life-threatening. They are mainly related to a delay in adequate treatment [40]. They are dominated by the extension to the parapharyngeal and retropharyngeal spaces,

descending mediastinitis, airway obstruction, sepsis, pneumonia, dehydration, Lemierre syndrome, acute epiglottitis, necrotizing fasciitis, carotid artery necrosis or aneurysm and intracranial infections [6,40]. Bilateral forms are more susceptible of causing upper airway obstruction and extension to surrounding deep neck spaces [19].

In cases of recurrent PTA, an elective tonsillectomy 4-6 weeks following the last PTA episode is recommended to insure a definitive treatment. It is also indicated for patients with recurrent tonsillitis [9]. It can be technically difficult due to fibrosis caused by repetitive infections [2].

CONCLUSION:

We studied epidemiological and clinical features as well as therapeutic modalities of peritonsillar abscess. Seasonal variations are not significant. Diagnosis is based on physical examination findings and needle aspiration. The choice of antibiotics is still variable but we the chosen molecules should cover both aerobics and anaerobes. Uncomplicated forms with minor symptoms can be managed with medical treatment alone. Incision drainage and needle aspiration are both curative drainage methods even though there is still no consensus about the optimal and most effective technique.

Compliance with ethical standards

Conflict of interest: The authors stated that there is no conflict of interest.

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