The Masticator Space Infection

SOMCHAI SRIROMPOTONG, M.D.*,
SUPAPORN SRIROMPOTONG, M.D.*

Abstract

The masticator space is an important suprahyoid tissue compartment. Infection of the masticator space can break through the fascia and involve the adjacent space. Severe complications including mediastinitis, pericarditis and death have been reported. The correct diagnosis and proper management are, therefore, crucial in order to reduce this complication. The authors reviewed 22 patients with masticator space infection between July 1996 and June 2001. All of the patients presented with trismus and 18 patients (81.8%) had a suspected dental cause of infection. Five patients had underlying disease; three were diabetic and two had human immunodeficiency virus (HIV) infection.

High dosage intravenous antibiotics directed towards the causative microorganism were given to all of the patients. Fourteen patients underwent surgical drainage and surgical drain was positive in eleven patients (78.5%). Routine aerobic cultures were done on samples of the drained material. Bacteriology showed *Streptococcus* spp. the dominant microorganism in three patients, *Pseudomonas* spp. in one patient and no growth in ten patients. Blood culture grew *Burholderia pseudomallei* in one patient who responded to medical treatment. Three patients had post-operative complications but all recovered.

Key word : Masticator Space, Infection

SRIROMPOTONG S & SRIROMPOTONG S
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* Department of Otolaryngology, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.

The masticator space contains the medial pterygoid, lateral pterygoid, and masseter muscle, plus the insertion of temporalis muscle onto the coronoid process of the mandible along with the inferior alveolar vessels and nerve. Loose connective tissue and fat surround these structures within the compartment, forming a potential space[1]. The superiorly positioned temporal space communicates freely with the masticator space[2,3]. The masticator space is an important suprahyoid tissue compartment. Infection of the masticator space can break through the fascia and involve the adjacent space such as the buccal, submandibular, parapharyngeal, and sublingual. Severe complications including mediastinitis, pericarditis and death, have been reported[4,5]. So correct diagnosis and proper management are important to reduce this complication. The aim of the study was to present the clinical presentations and treatment outcome of masticator space infection.

MATERIAL AND METHOD

The authors reviewed the clinical records of patients who were diagnosed with masticator space infection at the Department of Otolaryngology, Srinagarind Hospital, Khon Kaen University, Thailand, from July 1996 to June 2001. Twenty-five patients were identified but three patients were excluded from this study because of missing data. Records were reviewed for age, sex, duration of symptoms and hospitalization, presenting symptoms, underlying diseases, culture for aerobic bacteria, outcome of treatment and complications.

RESULTS

The patients' age ranged from 18 to 74 years, and averaged 38.4 years. There were eleven men and eleven women. The mean duration of symptoms prior to diagnosis was 5 to 9 days (range, 2 to 30 days). The mean period of hospitalization was 10 days (range, 3 to 27 days). The presenting symptoms of masticator space infection are shown in Table 1. All patients presented with trismus. Eighteen patients (81.8%) were suspected of having a dental cause of infection. Three patients also had diabetes and two were HIV positive. Fourteen patients underwent surgical drainage and were positive in 11 patients (78.5%).

The surgical drains of all patients were sent for routine aerobic culture. The results of culture are present in Table 2. The blood culture of one patient who had medical treatment grew *Burkholderia pseudomallei*. All patients were started empirically on high dose intravenous penicillin and antibiotics were changed after subsequent culture results were available. The average length of hospital stay was 5.9 days. Three patients had post-operative complications, one had temporary facial palsy in the marginal branch, two had acute renal failure and three had myocardial infarction and heart failure.

DISCUSSION

Odontogenic infection exhibited expected characteristics, being prevalent in the submandibular and masticator spaces[6]. In the present study the most common source of infection was dental causes (81.8%). One case had septicemia from melioidosis and had precipitation by dental infection producing masticator space infection. This case responded to antibiotic treatment. Trismus is an important sign of masticator space infection, which results from irritation of the mastication muscle - the medial and lateral pterygoid, masseter and temporalis muscle. Indeed, all the patients in this study presented with trismus.

Table 1. Presenting signs and symptoms of masticator space infection.

Symptoms and signs	All patients (n=22)		Positive surgically drained (n=11)		Negative surgically drained (n=3)		Medically treated (n=8)	
	n	%	n	%	n	%	n	%
Trismus	22	100	11	100	3	100	8	100
Fever	16	72.7	7	63.6	1	33.3	8	100
Check swelling	16	72.7	7	63.6	3	100	6	75
Check pain	10	45.5	3	27.3	2	66.7	5	62.5
Toothache	8	36.4	6	54.5	1	33.3	1	12.5
Previous tooth extraction	7	31.8	2	18.2	-		5	62.5
Odynophagia	4	18.2	3	27.3	-		1	12.5
Face swelling	4	18.2	4	36.4	-		-	
Sore throat	3	13.6	1	9.1	-		2	25

Table 2. Microbiology of operated cases.

No growth	10
Streptococcus viridan	1
Beta-hemolytic Streptococcus group D	1
Gamma-hemolytic Streptococcus not group D	1
Pseudomonas paucinobilis	1

The appropriate care of patients with masticator space infection requires an accurate determination of cellulitis or abscess formation. The differentiation between these can be clinically challenging. In 1999 Miller et al[7], demonstrated that the combination of clinical examination and contrast-enhanced computed tomography (CECT) in the evaluation of deep neck infection has the strongest sensitivity and specificity. Holt et al[8], Nyberg et al[9], and Som and Curtain[10] provided definitions for the radiological criteria to recognize normal, cellulitic and abscessed tissues. In the present study, fourteen patients that were clinically diagnosed with abscess in the masticator space but three patients (21.4%) had negative surgical drainage. Pathology of masticator space has been clinically difficult to diagnose and treat[11] so a combination of clinical evaluation and CECT may be needed to decrease negative surgical drainage.

Aerobic cultures were done routinely in all cases of surgical drain. Results were positive in four patients (28.6%) and negative in ten patients (71.4%). Three of four patients with positive aerobic cultures were *Streptococcus* spp. and one was *Pseudomonas* spp., which is an atypical finding in odontogenic infection. The microbiology of odontogenic infection is usually anaerobic in 60 per cent of cases, mixed aerobic and anaerobic 35 per cent and aerobic in <5 per cent[12]. Unfortunately, aerobic culture was not done because all patients had surgical drainage as an emergency procedure during the night and facilities for anaerobic culture were not available at that time. Due to the inability to culture anaerobic, in-group of positive aerobic culture the microbiology may be mixed with aerobic and anaerobic organisms. Group of negative culture the microbiology may be anaerobic organism or the routine use of high dose empirical antibiotic prior to surgical drainage may result in negative cultures.

There were post-operative complications in three cases because all cases had pre-operative preparation for emergency procedure and some cases had underlying disease. However, all three patients recovered from complications and they were cured of masticator space infection.

SUMMARY

The most common source of masticator space infection was odontogenic and all patients presented with trismus. The clinical diagnosis and treatment in this space are difficult. So, a combination of clinical and CECT is required for correct diagnosis and determines the need for surgery by differentiating cellulitis from abscess formation.

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การติดเชื้อใน masticator space

สมชาย ศรีร่มโพธิ์ทอง, พ.บ., สุภาภรณ์ ศรีร่มโพธิ์ทอง, พ.บ.**

Masticator space เป็นช่องที่อยู่เหนือต่อกระดูก hyoid การติดเชื้อในช่องนี้สามารถลามไปยังอวัยวะข้างเคียง ทำให้เกิดภาวะแทรกซ้อนได้ ซึ่งเคยมีรายงาน เช่น การติดเชื้อในทรวงอก เยื่อหุ้มหัวใจอักเสบ ซึ่งอาจถึงตายได้ การวินิจฉัยโรคที่ถูกต้องและการรักษาที่เหมาะสม จะช่วยลดภาวะแทรกซ้อนที่อาจเกิดขึ้นได้ รายงานนี้ได้ทำการศึกษาระหว่างเดือนกรกฎาคม 2539 ถึง เดือนมิถุนายน 2544 รวบรวมคนไข้ที่มีการติดเชื้อใน masticator space ทั้งหมด 22 คน ซึ่งคนไข้ทุกรายมีอาการอ้าปากไม่ขึ้น โดยสาเหตุเกิดจากมีการติดเชื้อจากฟัน 81.8% มีคนไข้ 5 คน ที่มีโรคประจำตัวได้แก่ โรคเบาหวาน 3 คน และโรคเอดส์ 2 คน การรักษาทุกคนได้รับยาปฏิชีวนะทางหลอดเลือดดำตามเชื้อที่เป็นสาเหตุ คนไข้ 14 คน ต้องได้รับการผ่าตัดระบายหนอง โดยพบหนอง 11 คน ทุกรายที่ได้รับการผ่าตัด มีการส่งเพาะเชื้อแบบ aerobic culture ผลเพาะเชื้อขึ้นเป็น *Streptococcus* spp 3 คน *Pseudomonas* spp 1 คน ส่วนอีก 10 คน ผลเพาะเชื้อไม่ขึ้น มีคนไข้ 1 คน ที่ผลเพาะเชื้อจากเลือดขึ้นเป็น *Burkholderia pseudomallei* ซึ่งคนไข้ตอบสนองได้ดีต่อยาโดยไม่ต้องผ่าตัด มีคนไข้ 3 คน มีภาวะแทรกซ้อนจากการผ่าตัด แต่ทุกคนก็หายจากภาวะแทรกซ้อน

คำสำคัญ : การติดเชื้อ, Masticator Space

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* ภาควิชาโสต ศอ นาสิก และลาริงซ์วิทยา, คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น, ขอนแก่น 40002