

Neck abscess: 79 cases

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ABSTRACT

OBJECTIVE: Neck abscess is a disease that might cause mortality and severe morbidity, if it is not treated urgently. In our study, patients with diagnosis of neck abscess in our clinic were analyzed retrospectively and presented in the light of the literature.

METHODS: In our clinic, age distribution, source of infection, systemic disease, imaging methods that were used in diagnosis, preferred anaesthesia during drainage, abscess sites, culture results of abscess material, complications during treatment procedure, any antibiotherapy before admission and duration of hospitalization of 79 cases with neck abscess who were treated in the hospital between January 2008 and January 2015 were assessed.

RESULTS: Cases in our study were aged between 1–79 (mean 28.3) years and 43 of them were female and 36 were male patients. Systemic diseases were determined in 19 of the cases. The most common systemic disease was diabetes mellitus. Abscesses were localized mostly at peritonsillar region and 13 of the cases were operated when abscess were in multipl localizations. In 74 of the cases, drainage was performed under local anaesthesia and in 5 cases under general anaesthesia. Four of these 5 cases, abscesses were localized within retropharyngeal region and 1 of them had multiple abscesses at various regions. Staphylococcus aureus was the most detected microorganism based on culture results. Three adult cases were followed up in the intensive care unit because of development of mediastinitis. One of these 3 cases exited because of sepsis. Hospitalization periods of 79 cases ranged between 2–21 days (mean 7.64 days). Hospitalization period of 19 cases with systemic diseases were 9.47 days ($p<0.05$) and statistically which were statistically significantly longer when compared with those without any systemic disease.

CONCLUSION: Neck abscess must be diagnosed early and treated with surgical drainage and parenteral therapy because it might cause severe complications.

Keywords: Abscess; complication; neck.

Neck abscess is infection of potential spaces of throat with bacterial pathogens which may present diagnostic difficulties and lead to serious complications. Previously, they had higher mor-

tality rates, however nowadays, early diagnostic methods, broad spectrum antibiotics and surgical interventions have dropped mortality rates substantially [1].



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Deep neck infections which play an important role among neck abscesses have been described firstly by Galen and currently their incidence rates have ranged between 9, and 12/100.000 [2]. Prompt diagnosis and treatment are important for neck abscesses, otherwise, they lead to the development of important complications as respiratory distress, mediastinitis, pseudoaneurysm, empyema, asphyxia and jugular vein thrombosis. Anatomical structure of the neck mainly consists of superficial and deep fascia and deep fascia divides into superficial, middle (visceral), and deep layers. Knowledge about anatomical and functional interrelationships between this fascia and their layers in the neck and their association with the primary source of infection is important with respect to our treatment. Treatment of neck abscesses priorly consists of maintaining the patency of the airway, drainage of the abscess and intravenous application of appropriate antibiotherapy [3]. In this study, 79 neck abscesses were investigated retrospectively and presented in the light of the literature.

MATERIALS AND METHODS

In our clinic, age distribution, source of infection, systemic disease, diagnostic imaging methods, anesthesia preferred during drainage, location of abscess, culture results of the abscess material, complications during treatment period and hospital stays were retrospectively investigated among 79 cases with abscess diagnosed in our clinic between January 2008 and January 2015. Patients with an improved general health state and those who could tolerate oral intake easily were closely followed up without hospitalization were not included in the study group.

Data obtained were organized using SPSS for Windows 20 program into a data base. Data were evaluated in SPSS 20 statistical package program. Level of statistical significance was set at $p < 0.05$

RESULTS

Our study population consisted of 43 female and 36 male patients aged between 1 and 79 years (me-

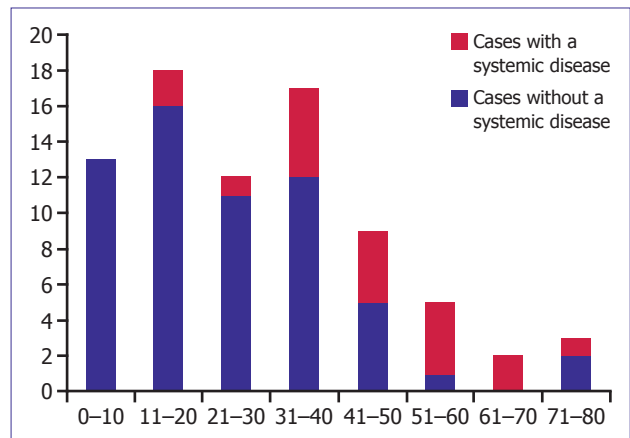


FIGURE 1. Total number of cases with or without systemic disease based on age groups.

dian, 28.3 years). In 19 of all cases, systemic disease was detected. Distribution of the systemic diseases and longevity of the hospital stay among cases according to age of the patients was investigated (Figure 1). Among systemic diseases, most frequently diabetes mellitus ($n=10$) then hypertension ($n=7$), and other systemic diseases (coronary artery disease, chronic obstructive pulmonary disease and asthma etc) ($n=10$) were detected. In more than 8 cases, systemic disease was found. Fifty-five cases reported use of antibiotherapy before admission to our clinic. Diagnostic accuracy rates for ultrasound (US) (21.5%; $n=17$), computed tomography (CT) (16.4%; $n=13$), combined US-CT use (25.3%; $n=20$), combined use of US, BT, and MRI (3.7%; $n=3$) in the diagnosis of neck abscess were determined. For twenty-nine cases which consisted of clinical diagnosis with peritonsillar abscess ($n=25$), submental abscess ($n=2$), and submandibular abscess ($n=2$) imaging modalities were not required. As sources of infection, firstly upper respiratory tract infections then odontogenic infections, infected congenital neck cysts, stabs of foreign objects, skin infection, surgical site infections and cholelithiasis were detected (Table 1). Abscess was most frequently detected on peritonsillar area and in 13 of all neck abscesses, abscesses localized on more than one area were intervened (Table 2). Abscess drainage was applied under local ($n=74$) or general ($n=5$) anesthesia. Four of these 5 cases who were

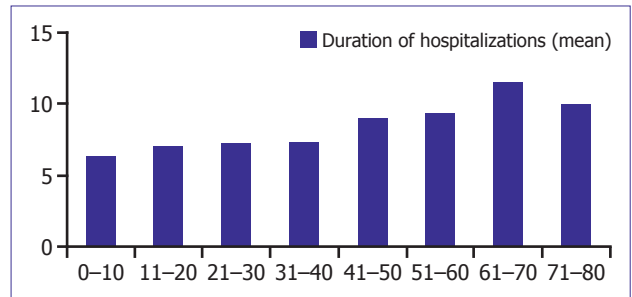
TABLE 1. Number of cases based on etiologic factors

Source of infection	Patients (n)
Upper respiratory tract infection	32
Odontogenic infection	24
Penetrating foreign object	3
Congenital cyst infection	3
Surgical site infection	2
Skin infection	2
Cyalolithiasis	1
Any etiologic factor could not be determined	12

TABLE 2. Number of cases based on the anatomical location of abscesses

Location of abscess	Patients (n)
Peritonsillar	29
Submandibular	22
Submental	12
Parapharyngeal	10
Retropharyngeal	5
Masticatory	5
Parotid	2
Retromolar	1
Infrahyoid	4
Superficial	5

operated under general anesthesia had only retropharyngeal abscess, while in one case abscesses were localized on more than one location. Microbiological examination of all 79 cases revealed methicilline-sensitive *Staphylococcus aureus* (n=7), *staphylococci spp.* (n=3), *Streptococcus anginosus* (n=3), *Streptococcus pyogenes* (n=3), *Candida albicans* (n=2), *Streptococcus mitis* (n=1), *Pseudomonas aeruginosa* (n=1), *Streptococcus agalactiae* (n=1), and *Klebsiella pneumoniae* (n=1). Bacterial growth was not detected in fifty-seven abscess materials. Forty-two out of these 57 cases were receiving antibiotherapy 2, and 10 days before consulting to our clinic ($p>0.05$). Upon development of mediastinitis in 3 adult cases, these

**FIGURE 2.** Hospital stay of the cases based on age groups.

patients were monitored under conditions of intensive care. One of these 3 cases exited because of sepsis. Because of impaired general health state one case was intubated and tracheotomy was applied in another patient and followed up under intensive care conditions because of respiratory distress and later the patient was discharged with cure. In one case with submandibular abscess, paralysis of the marginal mandibular branch of the facial nerve was observed. Until antibiotic susceptibility test results were obtained empirical treatment with broad spectrum antibiotics were initiated. After test results were acquired, treatment of the patient was reorganized after consultation with the department of infectious diseases. Hospital stay of 79 cases ranged between 2, and 21 days (median, 7.64 days). Average longevity of hospital stays based on age groups of the cases was evaluated (Figur 2). The longest hospital stay was seen among patients aged 61-70 years. Fifty-five patients (n=55) who received and did not receive (n=24) treatment previously were hospitalized for an average of 7.81, and 6.58 days, respectively ($p>0.05$). Average hospital stay of 19 cases with systemic disease was 9.47 days ($p<0.05$) which was statistically significantly longer when compared with those without any systemic disease.

DISCUSSION

Neck abscess is infection of potential spaces of throat with bacterial pathogens which may present diagnostic difficulties and risks of mortality, if not treated prematurely. Frequently, they occur as a result of upper respiratory tract infections followed

by odontogenic infections [4]. Infected neck cysts, penetrating foreign objects and surgical site infections may be considered as sources of infection. In some cases source of infection may not be detected [5]. In our study as etiologic factors most frequently upper respiratory tract infections, then odontogenic infections and other etiologies were found. In 13 cases any etiologic factor could not be detected.

Physical examination of the patient at his/her first admission is very important. Respiratory distress of the patient should be taken seriously, oropharynx and larynx should be very well evaluated as for development of complication(s) [6]. Progression and passage of the neck abscess through interconnected anatomical spaces may lead to the development of complications as empyema, pericarditis, mediastinitis, pericardial effusion, carotid artery rupture, aortopulmonary fistula, cranial nerve paralysis, cervical necrotizing fasciitis, jugular vein thrombosis, venous embolism, septic shock, disseminated intravascular coagulation, renal insufficiency, meningitis and epidural abscess [7]. In the literature, complication rates were indicated to range between 12.85, and 25.5 percent [8]. Abscesses of our five cases with respiratory distress were urgently drained. Four patients whose endoscopic examinations revealed retraction of the posterior pharynx and CT s demonstrated retropharyngeal abscess, while one patient with a diffuse abscess were operated because of these indications. In 3 of 5 cases with respiratory distress, mediastinitis was detected and postoperatively 2 of them were intubated and the third one was tracheotomized under intensive care conditions. Among these monitored cases, one intubated patient died of sepsis. Other intubated case and tracheotomized patient were discharged with cure.

In this study of ours, we detected that advanced age and concomitant systemic diseases are important predisposing factors which prolong hospital stay of these patients.

In a study by Chen et al. performed on 214 cases with deep neck infections, most frequently affected areas were reported as peritonsillar, parapharyngeal, submental and retropharyngeal regions in order of decreasing frequency. [9]. In a study by Miman et al. performed on 31 cases, peritonsillar abscess, retropharyngeal abscess and submandibular abscess were

reported as the most frequently affected regions in order of decreasing frequency [10]. In our group of 79 neck abscesses most frequently peritonsillar, submandibular and submental regions were affected.

Mostly US and CT were requested for patients with initial diagnosis of neck abscess. However, in some cases we required evaluation using MR in cases where we could not discriminate between cellulitis and abscess [11].

In 29 cases diagnosis of abscess was made without any need for imaging modalities. Twenty-five of these cases were diagnosed as peritonsillar abscess which was treated with local drainage.

In 22 of 79 cases bacterial growth was detected on culture. In 42 of 57 patients whose culture results could not demonstrate any bacterial growth had used antibiotics before consultation to our clinic. Bacterial growth cannot be seen in antibiotic susceptibility tests of the patients who used antibiotics previously. Besides, bacterial growth may not be detected on samples sent for antibiotic susceptibility tests under inappropriate conditions [12].

In cases with neck abscesses, on culture media most frequently staphylococci (*S.Aureus* and *S.epidermidis*), streptococci (*S.milleri* spp, and *S.viridans*), peptostreptococci, klebsiella, bacteroides spp. and fusobacterium spp. have been identified [13]. In our clinic, most frequently growth of *Staphylococcus aureus*, then other staphylococci spp., streptococci and other bacterial strains was identified.

In neck abscesses, administration of early and effective treatment is very important. Patients with impaired general health and oral intake should be also hospitalized and treatment with parenteral broad spectrum antibiotics should be initiated [14]. In our clinic, empirically, parenteral ampicillin-sulbactam treatment is administered for adult patients at daily doses of 2 g, and pediatricians organize treatment for pediatric patients. After location of the abscess, drainage is applied.

Conclusion

In cases with neck abscess, priorly a safe airway patency should be maintained. Afterwards, parenteral medical treatment should be initiated and under

appropriate conditions surgical drainage should be applied. Resorting to the imaging modalities for the determination of clinical status of the patient helps the physicians. Because of life-threatening complications, in the treatment process of neck abscess, extreme care should be instituted.

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