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Clinical Study of Deep Neck Space Infections-Retrospective Study

Srikanth Myla[1], Asha Rani Peruri[2]

[1]Professor, Department of Otorhinolaryngology,
[2]Postgraduate, Department of Otorhinolaryngology, S V S Medical College, Mahabubnagar, Telangana state, 509001, India

Abstract: ***A clinical study was undertaken to evaluate the age, sex incidence of deep space neck infections among patients admitted in ENT ward of s v s medical college and hospital. Clinical study of deep neck space infections regarding aetiological factors like micro-biological features, portals of entry in the pathogenesis of deep neck space infections in the patients selected. Thorough evaluation regarding presenting symptoms, signs and complications associated with deep neck space infections in the patients selected. Study of medical (conservative) and surgical procedure adopted for treatment of deep neck abscesses in the patients selected. Post operative follow-up and success rate of surgical procedures adopted for deep neck space infections in the patients selected.***

Keywords: Deep neck space infection, submandibular space, parapharyngeal space, Ret-ropharyngeal space, incision and drainage.

1. Introduction

Formerly, infections of the deep fascial spaces of the head and neck were fairly common and were a source of considerable morbidity and mortality. The advent of antibiotics has reduced the overall number of deep necksapce infections, they still occur in the general population, with a definite potential for significant morbidity, and even mortality, with improper or delayed treatment. Additionally, there are several new groups of patients at risk for deep neck space infections, such as immunocompromised individuals recovering from organ transplants or chemotherapy, or those with acquired immunodeficiency syndrome (AIDS) and the increasing numbers of drug addicts who are injecting drugs into various areas of the neck. Prevention of the severe sequelae that may be associated with deep neck space infections (such as mediastinitis, airway obstruction, carotid artery hemorrhage, or septicemia) requires a knowledge of the various portals of entry for infection, the presenting signs and symptoms, the possible microbiologic features, appropriate laboratory and radiologic workups, and the various treatment options. Additionally, proper treatment requires knowledge of the various fascial planes that infections travel along to assure complete and adequate drainage.

Infections of the deep neck spaces present a challenging problem for several reasons: Complex anatomy, Deep Location: Deep neck infections may be difficult to palpate and impossible to visualize externally. Difficult Access, close Proximity to important structures, Communication to other portions of body (e.g. mediastinum, coccyx), placing areas outside of the head and neck at risk of involvement when these spaces are involved.

2. Materials and Methods

A retrospective study was carried out from 2008 to 2012atdepartment of Otorhinolaryngology at s v s medical college and hospital, Mahabubnagar. Total 40patients were selected for the study.

Inclusion criteria: patients history, Physical examination, Radiology: X-ray neck for soft tissues: AP, Lateral views, Needle aspiration: Culture & sensitivity studies.

3. Observation and Discussion

This discussion is based on the study of 40 patients who were treated in s v s medical college and hospital, Mahabubnagar, during 2008to2012 that is for period of 5 years.

Table 1: Incidence of Deep neck space infections

S.No	*Year*	*Total Patients admitted in ENT ward*	*Patients deep neck space infections*	*% of incidence of DNSI*
1.	2008	640	8	1.2
2.	2009	624	9	1.4
3.	2010	600	7	1.1
4.	2011	682	7	1.02
5.	2012	700	9	1.2

Among the patients admitted in ENT ward about **1.18%**observed to be suffered from deep neck space infections.

Table 2: Age incidence of Deep neck space infections:

S.No	*Age in years*	*40 patients*	*% percentage*
1.	0-1 year	Nil	Nil
2.	1-7 years	3	7.5
3.	7-14 years	5	12.5
4.	14-30 years	19	47.5
5.	30-50 years	9	22.5
6.	50-70 years	4	10

Deep neck space Infections involves commonly adults of 2nd to 3rd decade. In our study no infant involved and lowest age is 5 years child. In our study 3 children involved between 1-7 years, 5 children 7-14years, 19 patients involved between 14-30 years, 9 patients involved between 30-50 years, 4 patients involved between 50-70 years. In our study maximum age incidence of Deep neck space infections 14-30 years.

Table 3: Sex incidence Deep neck space infections

S.No	*Sex*	*40 patients*	*% percentage*
1.	Male Children	5	12.5
2.	Female Children	3	7.5
3.	Male Adults	19	47.5
4.	Female Adults	13	32.5

A deep neck space infection usually involves males than females usual M: F ratio is 2: 1 according to previous standard records. In our study 24 males, 16 females involved, among them 5 male children, 3 female children, 19 male Adults, 13 female adults. In our study male adults commonly involved, and M: F ratio is 3: 2.

Table 4: Incidence of specific neck abscesses

S.No	*Site of Abscess*	*40 patients*	*% percentage*
1.	Submandibular Abscess	23	57.5
2.	Retropharyngeal Abscess	12	30
3.	Parapharyngeal Abscess	5	12.5

Among deep neck space infections 3 mainly and commonly involved spaces are submandibular, retropharyngeal, Parapharyngeal abscess. In our study 23 patients (57.5%) involves submandibular abscess, 12 patients (30%) involves retropharyngeal abscess, 5 patients (12.5%) involves parapharyngeal abscess. In children usually retropharyngeal abscess common, but in adults submandibular abscess more common.

Table 5: Source of infection of deep neck space infections

S.No	*Source of Infections*	*40 patients*	*% percentage*
1.	Odontogenic	20	50
2.	Pharyngotonsillar	10	25
3.	Traumatic	3	7.5
4.	Otogenic	2	5
5.	Unknown	5	12.5

Generally deep neck space infections of children are Pharyngotonsillar origin, but in adults, it is mainly odontogenic origin. Recently, deep neck space infections are due to intra venous drug abusers, tuberculosis and HIV. In our study 20 patients (50%) having odontogenic origin, 10 patients (25%) from pharyngotonsillar origin, 3 patients (7.5%) from traumatic origin either foreign body (or) instrumentation, 2 patients (5%) otogenic origin, 5 patients (12.5%) did not have definite cause (unknown).

Table 6: Presenting Symptoms of deep neck space infections

S.No	*Symptom*	*40 patients*	*%percentage*
1.	Fever	30	75
2.	Pain	40	100
3.	Odynophagia	21	52.5
4.	Dysphagia	13	32.5
5.	Nasal obstruction	3	7.5
6.	Voice change	7	17.5

In our study 30 patients (75%) fever, all patients having pain, 20 patients (52.5%) odynophagia, 13 patients (32.5%) dysphagia, 3 patients (7.5%) nasal obstruction, 7 patients (17.5%) voice change. In our study fever, pain most common symptoms of deep neck space infections.

Table 7: Signs of deep neck space infections

S.No	*Signs*	*40 patients*	*% percentage*
1.	Swelling	40	100
2.	Trismus	18	45
3.	Neck rigidity	13	32.5
4.	Dental caries	21	52.5
5.	Pharyngotonsillar infection	15	37.5
6.	Laryngeal infection	9	22.5

Common signs in deep neck space infections are swelling, dental caries, trismus, pharyngotonsillar infection, neck rigidity. In our study all patients presented with swelling, 21 (2.5%) having dental) having dental caries, 18 patients (45%) having trismus, 13 patients (32.5%) having neck rigidity, 15 patients (37.5%) having pharyngotonsillar infection, 9 patients (22.5%) having laryngeal infection.

Table 8: Incidence of complications of deep neck space infections

S.No	*Complication*	*40 patients*	*% percentage*
1.	Airway obstruction	9	22.5
2.	Mediastinitis	2	5
3.	Septic thrombophlebitis	-	-
4.	Haemorrhage	-	-
5.	Cranial nerve palsies	-	-

Complications of deep neck space infections mainly airway obstruction, occasionally mediastinitis, septic thrombophlebitis, haemorrhage from great vessels erosion, cranialnerve palsies. In our study 9 patients (22.5%) present with stridor, 2 patients (5%) with mediastinitis, remaining complications did not occur in our study.

Table 9: Treatment of deep neck space infections

S.No	*Treatment*	*40 patients*	*% percentage*
1.	Medical	7	17.5
2.	Internal I & D	11	27.5
3.	External I & D	22	55

The main stay of treatment in deep neck abscess is incision and drainage but some cases may completely resolve with medical treatment only. In our study 11 patients (27.5%) treated with intraoral incision and drainage, 22 patients (55%) treated with that external incision and drainage, 7patients (17.5%) treated conservatively, all patients followed up, no patient had recurrence. In our study external incision and drainage is main stay of treatment in deep neck space infection admitted in ENT- ward, and then followed by intraloralincision and drainage and conservative treatment.

Table 10: Microbiology of deep neck space infections

S.No	*Organism*	*40 patients*	*% percentage*
1.	Streptococcus Pyogenes	28	70
2.	Staphylococcus aureus	19	47.5
3.	Streptococcus Pneumoniae	6	15
4.	H. Influenza	4	10
5.	Anaerobes	14	35

Deep neck space infections are usually caused by mixed flora consists of streptococcus pyogenes, Staphylococcus

aureus, anaerobes, but now a day's gram negative rods are involving especially in immunocompromised, debilitated patients, organ transplants and diabetics. These are klebsiella, H.Influenza. The anaerobes peptostreptococcus, and bacteroids are mainly involved. In our study Streptococcuspyogenes, staphylococcus aureus, and anaerobes are commonly involved.

4. Conclusions

Previously deep neck space infections were fairly common and were source of considerable morbidity and mortality. After the advent of broad spectrum antibiotics, the overall incidence of deep neck space infections is reduced. In our study incidence of deep neck space infections is 1.18%.Deep neck space infections usually involves not only adults between 2nd to 4th decade and also paediatricpopulation. In our study most of patients (adults) are aged of 14 to 30 years and children aged of 7 to 12 years.Deep neck space infections usually involves males than females and M: F ratio is 2: 1. In our study male adults are commonly involved followed by female adults, male children, female children and M: F ratio is 3: 2 (our study).Among deep neck space infections submandibular abscess is common in adults followed by retropharyngeal abscess, parapharyngeal abscess but in paediatric population retropharyngeal abscess is common followed by parapharyngeal abscess, submandibular abscess. In our study submandibular abscess is common, followed by retropharyngeal abscess, parapharyngeal abscess.

Previously most of deep neck space infections are pharyngotonsillar origin, but now a day these are due to odontogenic origin. But in paediatric population these are mainly due to pharyngotonsillar origin. Recently intravenous drug abuses, tuberculosis, HIV are one of the sources of deep neck space infections. In our study most of deep neck space infections are due to odontogenic origin followed by pharyngotonsillar, traumatic, unknown origin.

Deep neck space infections usually presented with fever, pain and neck swelling and also dental pain, odynophagia, dysphagia, voice change, occasionally nasal obstruction. In our study fever, pains are most common symptoms followed by dental pain, odynophagia, dysphagia.Signs of deep neck space infections are swelling, trismus, dental caries, neck rigidity. In our study swelling is the most common sign followed by dental caries, trismus and neck rigidity.

Most common complication of deep neck space infections is air way obstruction, rarely mediastinitis, hemorrhage from great vessels, septic thrombophlebitis, cranial nerve palsies. In our study 3 patients presented with airway obstruction, 2 patients complicated with mediastinitis, remaining complications are not seen in our study.Main stay of treatment of deep neck space infections is incision and drainage which is either external or internal. In our study most of the patients treated with external incision and drainage followed by intra oral incision and drainage, some patients treated conservatively or medical treatment only. Microbiology of deep neck space infections mainly mixed flora which consists of streptococcus pyogenes, staph.aureus, anaerobes (Peptostreptococci, bacteroids). Rarely gram negative rods like H.influenza, Klebsiella are common in immunocompromised, debilitated patients, diabetics, organ transplants, patients who are in Chemotherapy. Methicillin resistant staph.aureus is common in intravenous drug abusers. In our study streptococcus pyogenes, staph aureus, anaerobes are commonly involved.

In our study all patients were followed up and no patient had recurrence.
In our study average hospitalization stay of deep neck space infection is 10 days.

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Author Profile

Dr. Srikanth Myla, Professor, Department of otorhinolaryngology,

Dr. Asharani Peruri, Post Graduate, Department of otorhinolaryngology, S V S Medical College, Mahabubnagar, Telangana state. 509001