Retrospective study of descending cervical mediastinitis

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Abstract

Objective Descending cervical mediastinitis can occur as a complication of oropharyngeal and cervical space that spread to the mediastinum via cervical space. Descending mediastinitis represents a virulent form of mediastinal infection requiring prompt diagnosis and treatment to reduce high mortality associated with the disease. Surgical management and a particularly optimal form of mediastinal drainage remain controversial.

Method From 1998–2004, eighteen patients were treated in our institution. Surgical treatment consisted more than 2 times. Cervical drainage associated with drainage of the mediastinum through a thoracic approach in 11 patients with pleural drainage in 8 patients.

Result The outcome was favorable in eleven patients who had mediastinum drained through thoracotomy. One patient who was not drained died with tracheo-oesophageal fistula. Main culprit neck space is pre and para tracheal space which lead to anterior, superior and posterior mediastinal collection in our series. The tracheostomy is of immense help not only in opening cervical space collections and also to secure a partially compromised airway.

Introduction

Descending Cervical Mediastinitis (DCM) is a rare disease and it is mainly related to virulent presentation of infection that may arise from odontogenic or cervicofacial infection, or oesophageal perforation. Cervical Exploration with debridement and mediastinal drainage are the corner stones of aggressive treatment with broad spectrum antibiotic in intensive Care unit management but mortality still remains as high as 40%. Infection spreads along deep cervical fascial planes into the mediastinum, wide spread cellulitis, necrosis, abscess formation and sepsis.

The aim of this study was to evaluate the result of Surgical management with thoracotomy associated with cervical drainage used in management of cases of this series.

Patients and Methods

Between 1998 to 2004, 18 patients were treated for descending cervical mediastinitis in our institution. 10 patients were male and 8 patients are female. Minimal age is 10 years and maximum age limit is 69 years. In 8 cases (44%) patients were known Diabetics taking treatment. 3 patients on steroid for chronic obstructive pulmonary disease and another patient was in post partum period. Rest have no other underlying pathological disease. In majority patients hospital stay was more than 4 weeks. All patients required close observation in ICU. Main source of infection was Odontogenic

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Table 1 Causes of Descending Mediastinitis

Cause	No. of Patients
Total No. of cases	18
1. Odontogenic	12 (66.8%)
2. Oesophageal perforation	02 (11.1%)
3. Peritonsillar abscess	01 (5.1%)
4. Cervical Lymphadenitis with Necrotic skin	03 (16.2%)

Table 2 Bacteriology (Microbiologic features in DCM)

Total No.18		
Pus		
Staph. Aureus	-	08
Klebsiella	-	05
Pseudomonas	-	04
Proteus	-	01
Blood		
E.Coli + roteus	-	01
Sterile	-	17
Pleural fluid		
Pseudomonas	-	05
Sterile	-	13

(66.8%), Peritonsillar abscess in (5%) cases and oesophageal perforation (11.1%).

Cervical Lymphadenitis with necrotic skin was seen in 16.2% cases. Delay between onset of primary infection and hospital admission was 5 to 7 days, 80% patients received antibiotics from local doctor, so initial clinical features were masked.

Patients complained of diffuse cervical pain and swelling neck in 90% cases, dyspnoea 43%, dysphagia 50% cases. Cellulitis, Erythematous skin and chest wall and neck was present in all cases.

Parapharyngeal bulge or features of laryngeal compression was present in 60% cases. Cervical skin discolouration and necrotic deep fascia with induration was present in 3 cases. Blood culture was negative in 87.5% cases except 3 patients, who had positive blood cultures which contain E. coli, Pseudomonas. On neck exploration, foul smelling pus was seen in 80% cases which contain mixed infection. Staph. Aureus was present in 4 cases. Rest of cases showed Klebsiella, Streptococci and Pseudomonas.

All cases shows mediastinal widening in plain X-ray chest with bilateral pleural collection in 9 cases

(50%) and subcutaneous air trapping in 3 cases. Mediastinal collection mainly anterior and posterior mediastinum with pleural effusion seen in 17 cases. In one case unable to do CT scan thorax because patient expired after few hour stay in hospital.

Management

Emergency treatment was carried out in all cases. Wide lateral cervical incisions were given to allow full access to all infected spaces. Parapharyngeal space, submandibular space pre and para tracheal space were exposed and drained. In two cases internal Jugular vein thrombosis was found. In 3 cases infra hyoid muscular masses and the sterno cleido mastoid muscle were excised in necrotizing fascitis, Copious cleaning with iodized solution was done twice a day in vascular, para – oesophageal, pre tracheal spaces with proper drainage in neck. Cervical wounds are left open till all involved spaces of neck become dry for pus drainage.

In 11 cases (61.1%) thoracotomy was done along with cervical exploration. Mediastinal spaces were explored via cervical approach in all 11 cases with thoracic approach. Open drainage of anterior and posterior mediastinum was performed with multiple large bore tube. Posterolateral thoracotomy allowed removal of unhealthy mediastinum tissue and pleural and pericardiac drainage. Intercostal tube drainage was required in 8 cases along with mediastinal drainage because of extreme pleural collection. Rest responded with medical treatment. In our series tracheostomy was performed in 10 cases for ventilatory support and exploration of pretracheal and paratracheal space as well. In post operative period antibiotics mainly used were according to culture report like clindamycin, cefprizim, metronidazole in all cases, Linex, Amikacin in few cases.

Results

Complete recovery was obtained in 11/18 cases and the mean duration of hospitalization in the intensive care unit was 30 days.

Fig. 1 Diagnostic radiological feature of neck and chest**Fig. 2** Diagnostic CT scan feature

Fig. 3 Diagram of neck spaces

Duration of drainage depended on the clinical evaluation and CT scan Neck and thorax. 9 cases required repeated neck exploration and exploration of thorax once. Myocardium was necrotic in 2 cases. Unfortunately 7 patients expired out of 18 cases. One patient died by visceral rupture, one patient because of multiorgan failure and rest died because of septicemia. There were many complications

like toxic shock in 3 cases, Pneumonia in 12 cases, Venous thrombosis in 2 cases, Visceral perforation in one case. 11 patients fully recovered from disease.

Discussion

Descending cervical mediastinitis occurs as a complication of neck space infection. Infection mainly originates in the fascial plains of head and neck spaces and spreads downwards into the mediastinum along cervical plains, fascilitated by gravity, breathing and negative intrathoracic pressure. The cervical fascia has one superficial and three layers of deep cervical fascia. These layers partitions the neck into several potential spaces like pre tracheal, retropharyngeal, Perivascular space or parapharyngeal space that

Table 3

Surgical procedure for DCM

1. Mediastinal drainage via (cervical) approach & Neck space drainage – All 18
2. Cervico mediastinal drainage with subsew\quent thoracotomy – 11

all can serve as portals of entry into the mediastinum. The most common anatomic pathway is the lateral pharyngeal space through retrovisceral space, paratracheal space into inferior mediastinum. The visceral vascular space located within the carotid sheath was connected to the 3 layers of deep cervical fascia and there fore can be involved in neck infections. Internal Jugular vein thrombosis was found in two cases in our series.

Descending cervical mediastinitis show the relationship between mediastinitis and oropharyngeal infection. The most common primary specific foci is odontogenic 62.2% peritonsillar abscess was 6.1% cases.

Delay in diagnosis of descending cervical mediastinitis is main reason for high mortality. The diagnosis of cervical infection is often obvious but early diagnosis of mediastinitis is often difficult because vagueness of early symptoms, conventional radiological study of chest often gives various features like mediastinal widening in superior mediastinum, emphysema. In all cases of our series patient has toxic look with supra sternal erythema or cellulitis with positive CT scan neck and thorax. CT scan was clear indication of involvement of anterior and posterior mediastinum in all 17 cases out of which 11 patient underwent thoracotomy. 7 patient responded to a medical treatment because of less collection in the mediastinum. Anterior mediastinum was invariably drained with neck drainage in all cases by blunt finger dissection. Standard posteriolateral thoracotomy approach for posterior mediastinum perform was by the thoracic surgeons, which provides good exposure of pleural, pericardial and other compartments of mediastinum.

Comments

In our series of 18 cases from 1998 to 2004 all patients underwent early emergency cervical drainage with thoracotomy subsequently with aggressive medical treatment to reduce mortality rate to 32.2% of this highly lethal disease. Death in our series was due to late presentation of patient with vague clinical features, hence mortality still remain high despite of all aggressive management.

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