

## A Favorable Outcome in a Patient with Descending Mediastinitis Who Was Treated By Intensive Care Including Tracheostomy

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**Abstract:** An 84-year-old woman became unconscious and febrile after complaining of general pain. Her past history included gastrectomy for gastric cancer, hypertension, cerebral infarction and femur fracture; however, she was able to live independently. On arrival, her Glasgow Coma Scale score was 11. A physical examination revealed the following findings: blood pressure, 130/66 mmHg; a heart rate, 86 beats per minute; respiratory rate, 30 breaths per minute; SpO<sub>2</sub>, 90 % under room air; and body temperature, 38.0°C. Her left neck and anterior chest showed redness and swelling. Computed tomography to detect the focus of sepsis revealed retropharyngeal, deep neck and periaortic fluid collection, suggesting descending mediastinitis (DM). During investigations to identify the cause of the patient's unconscious state, her blood pressure and respiratory function deteriorated; thus, tracheal intubation was performed. She was moved to the intensive care unit and drainage of the retropharyngeal abscess was performed. She was treated with multiple drugs and the presence of refractory shock. She also received tracheostomy, including the opening of the superior mediastinal space. After these treatments, her respiration and circulation became stable. *Streptococcus pyogenes* was detected in the blood and abscess cultures. Finally, her tracheostomy spontaneously closed and she became able to feed herself. In the early stage of DM, a less invasive surgical approach in addition to multidisciplinary treatments may be effective for obtaining survival.

**Keywords:** descending mediastinitis; intensive care; tracheostomy.

## INTRODUCTION

The majority of mediastinitis cases are associated with cardiovascular operations; however, other possible etiologies include esophageal perforation, tracheobronchial perforation, the mediastinal extension of pulmonary infections, and the mediastinal extension of head and neck infections [1,2]. When the condition originates from an infection in the cervical or oral region, the mediastinal inflammation is referred to as "descending mediastinitis" (DM). The conditions that can lead to descending mediastinitis include retropharyngeal abscess, Ludwig's angina and odontogenic infection [1]. Since descending mediastinitis represents a potentially lethal condition if not promptly treated, it must be considered an emergency.

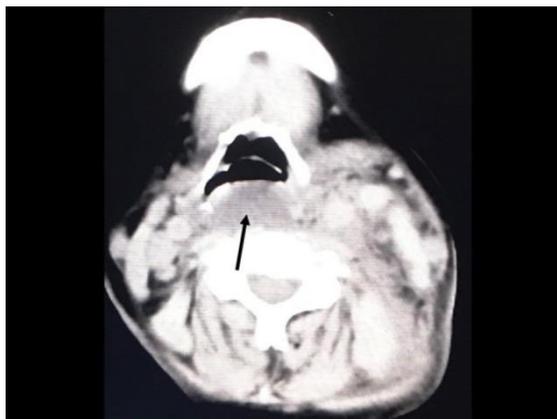
## CASE PRESENTATION

An 84-year-old woman became unconscious and febrile after complaining of general pain. She was transported to our hospital by ambulance. Her past history included gastrectomy for gastric cancer, hypertension, cerebral infarction and femur fracture; however, she was able to live independently. On arrival, her Glasgow Coma Scale score was 11. A physical

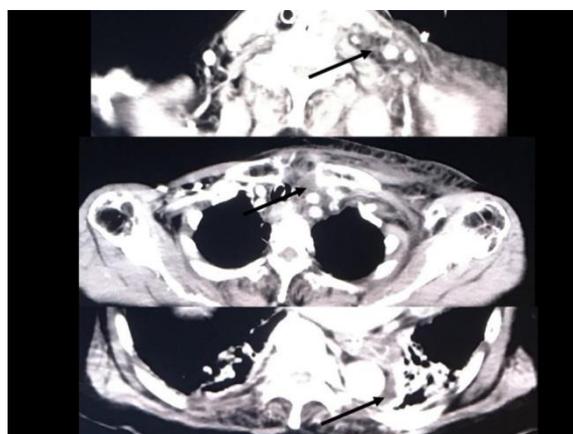
examination revealed the following findings: blood pressure, 130/66 mmHg; a heart rate, 86 beats per minute (BPM); respiratory rate, 30 BPM; SpO<sub>2</sub>, 90 % under room air; and body temperature, 38.0°C. Her left neck and anterior chest showed redness and swelling. A venous gas analysis revealed the following findings: pH, 7.452; PCO<sub>2</sub>, 29.7 mmHg; PO<sub>2</sub>, 45.5 mmHg; HCO<sub>3</sub><sup>-</sup>, 20.5 mmol/l; and lactate, 3.1 mmol/l. Electrocardiography revealed sinus tachycardia. Chest roentgenography revealed cardiomegaly. At first, soft tissue infection was suspected; thus, the patient was treated with ceftriaxon after obtaining blood samples for culturing. However, CT to detect the focus of sepsis revealed retropharyngeal, deep neck and periaortic fluid collection, suggesting DM (Figure 1 and 2) [3]. During investigations to identify the cause of the patient's unconscious state, which included spinal tap and head magnetic resonance imaging, her blood pressure and respiratory function deteriorated; thus, tracheal intubation was performed in addition to the administration of an infusion of noradrenalin and a massive infusion of lactate Ringer. The main results of a biochemical analysis of the blood were as follows: white blood cell count, 19,100/μl; hemoglobin, 13.8 g/dl; platelet count, 17.9 × 10<sup>4</sup>/μl; aspartate

aminotransferase, 24 IU/L; alanine aminotransferase, 12 IU/L; glucose, 142 mg/dl; blood urea nitrogen, 24.2 mg/dl; creatinine level, 0.75 mg/dl; creatinine phosphokinase, 44 IU/l; activated partial thromboplastin time, 30.7 (25.3) s; international normalized ratio of prothrombin time, 1.15; and fibrinogen degradation products, 8.5 mg/dl. A qualitative urinary test was negative for leukocytes and glucose, and positive for protein and occult blood. The results of an analysis of the patient's cerebrospinal fluid were as follows: cell count, 3/mm<sup>3</sup>; glucose, 73 mg/dl; and protein, 66 mg/dl. She was moved to the intensive care unit and drainage

of the retropharyngeal abscess was performed. She was treated with meropenem, clindamycin, linezolid, gamma globulin, anti-thrombin and steroids, based on the microscopic findings of the abscess (gram-positive cocci) and the presence of refractory shock. She also received tracheostomy, including the opening of the superior mediastinal space. After these treatments, her respiration and circulation became stable. *Streptococcus pyogenes* was detected in the blood and abscess cultures. Finally, her tracheostomy spontaneously closed and she became able to feed herself. She was transferred to another medical facility for rehabilitation.



**Fig-1: Computed tomography (CT) on arrival Cervical CT for the detection of the focus of the sepsis revealed retropharyngeal fluid collection (arrow), suggesting abscess formation**



**Fig-2: Computed tomography (CT) on arrival Chest CT revealed deep neck and pericarotid arterial and aortic fluid collection (arrow), suggesting descending mediastinitis**

## DISCUSSION

The primary treatment for DM consists of antibiotics and surgical drainage. Broad spectrum antibiotics and good coverage against anaerobes should be the first choice for descending mediastinitis[1]. However, intravenous broad-spectrum antibiotic therapy alone is not curative without surgical drainage of the cervical and mediastinal collections, we performed drainage of the retroperitoneal abscess in addition to tracheostomy and opening of the superior mediastinal space. Several different types of surgical approach for DM have been described, including a transcervical approach, posterolateral thoracotomy,

median sternotomy, clamshell incision, and a subxiphoid approach [1]. With the exception of the transcervical approach, most of these approaches are highly invasive. The surgical management of DM is currently a focus of controversy. Many surgeons emphasize that the mediastinum cannot be drained adequately by a transcervical approach [4]. They call for compulsory mediastinal exploration and debridement, irrespective of the level of involvement.[4] However, Wei *et al.* reported the following less invasive protocol: transcervical drainage should be performed for all cases of DM with additional closed thoracic drainage for DM with pleural effusion

or empyema. They achieved satisfactory clinical outcomes with this protocol. As our patient had early-stage DM, drainage of the retropharyngeal abscess, and the opening of the deep neck space and superior mediastinum through tracheostomy—a modified transcervical approach—was effective. Hsu *et al.* also reported that successful outcomes were achieved with the use of less invasive treatment of the deep neck and DM, in addition to multidisciplinary approaches, similar to us[5].

## CONCLUSION

In the early stage of DM, a less invasive surgical approach in addition to multidisciplinary treatments may be effective for obtaining survival.

## Conflict of interest

The authors declare no conflicts of interest in association with the present study.

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