

## SMALL SERIES OF MEDIASITINIS CASES ASSISTED AT THE LOURENÇO JORGE DE HOSPITAL MUNICIPAL IN THE LAST 3 YEARS

---

### *Sabrina Oliveira dos Santos*

Matheus Rangel Service of General Surgery and Trauma at The Lourenço Jorge Municipal Hospital - Rio de Janeiro - Rj - Brazil

### *Rodrigo Andrade Vaz de Melo*

Matheus Rangel Service of General Surgery and Trauma at The Lourenço Jorge Municipal Hospital - Rio de Janeiro - Rj - Brazil

### *Bruno Vaz de Melo*

Matheus Rangel Service of General Surgery and Trauma at The Lourenço Jorge Municipal Hospital - Rio de Janeiro - Rj - Brazil

### *Luana Gouveia Rio Rocha do Carmo*

Matheus Rangel Service of General Surgery and Trauma at The Lourenço Jorge Municipal Hospital - Rio de Janeiro - Rj - Brazil

### *Gustavo Pereira Dourado*

Matheus Rangel Service of General Surgery and Trauma at The Lourenço Jorge Municipal Hospital - Rio de Janeiro - Rj - Brazil

### *Lais Souza Germano*

Matheus Rangel Service of General Surgery and Trauma at The Lourenço Jorge Municipal Hospital - Rio de Janeiro - Rj - Brazil

All content in this magazine is licensed under a Creative Commons Attribution License. Attribution-Non-Commercial-Non-Derivatives 4.0 International (CC BY-NC-ND 4.0).



***Juliana Marinho Bastos***

Matheus Rangel Service of General Surgery and Trauma at The Lourenço Jorge Municipal Hospital - Rio de Janeiro - Rj - Brazil

***Clara Teixeira Cavarsan de Castro***

Matheus Rangel Service of General Surgery and Trauma at The Lourenço Jorge Municipal Hospital - Rio de Janeiro - Rj - Brazil

## **INTRODUCTION**

Acute mediastinitis is a severe infection of the connective tissue that fills the mediastinal interpleural space and surrounds the mid-thoracic organs. It has, as one of its most serious and often lethal presentations, descending necrotizing mediastinitis (DMN), which is due to the descending dissemination of deep neck infections, infections that can arise as a complication of “banal” odontogenic, pharyngeal and cervicofacial foci”, not including translocation of infection from non-cervical mediastinal regions (lungs, ribs...). It is noteworthy that esophageal perforation and postoperative infections after sternotomy incisions in patients undergoing cardiac surgery more often result in isolated mediastinal abscesses, not being considered MND.

Diagnostic criteria for MND include (1) clinical manifestations of severe cervical infection, (2) demonstration of radiographic features characteristic of mediastinitis, (3) documentation of mediastinal necrotizing infection at operation or postmortem examination or both, and (4) establishment of the relationship between oropharyngeal infection and development of the mediastinal necrotizing process (Ridder GJ, Maier W, Kinzer S, Teszler CB, et al; Papalia E, Rena O, Oliaro A, et al.



Soft tissue enlargement in the upper left mediastinal topography with intermingled gas foci, configuring a local infectious process.

No definitive treatment for MND has been clearly established. According to the literature, the ideal form of mediastinal drainage and the surgical approach remain controversial with indications ranging from isolated cervical drainage to cervical drainage with routine thoracotomy. As they present as a simple infection in the initial stage, they are often underestimated and aggressive treatment, including transoral and transcervical drainage, ends up being delayed, with morbidity and mortality rates of up to 40% being reported in the literature.

Soft tissue enlargement in the upper left mediastinal topography with intermingled gas foci, configuring a local infectious process.

### CASE SERIES

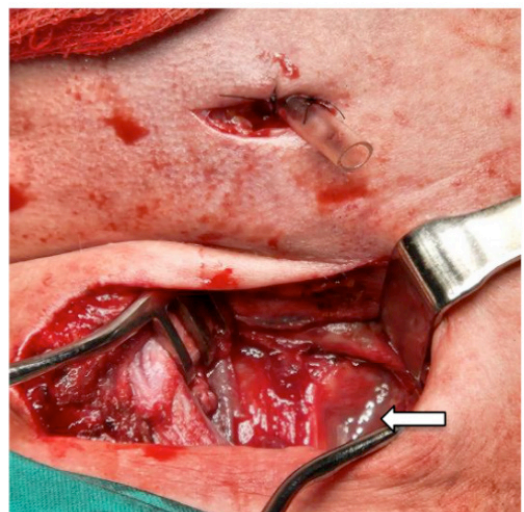
We retrospectively analyzed cases of acute mediastinitis treated at the service in the last three years, from January 2020 to September 2022. Patients with disseminated infection from oropharyngeal/cervical origin progressing to below the tracheal bifurcation were defined as having NDM. The diagnosis was established by clinical, radiographic and transoperative findings.

We found 03 cases of acute mediastinitis, all

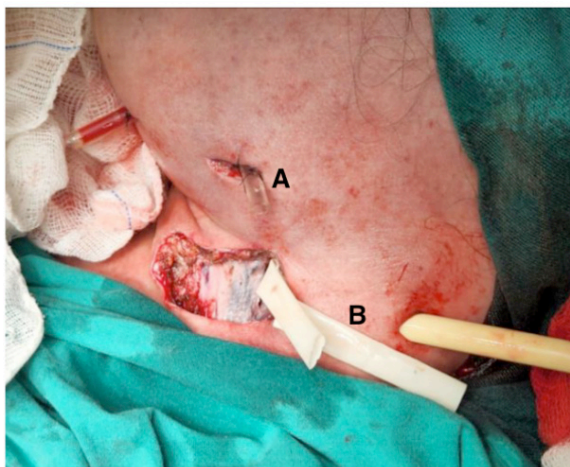
female patients aged between 18 and 29 years (mean age 22 years) and without associated comorbidities. All had MND, two of which were due to odontogenic infections (one root canal treatment, another gingival abscess) and one from tonsillitis.

The two patients with odontogenic infections were admitted to our service with an infectious condition of 6 and 15 days, while the patient with tonsillitis, 10 days of evolution, with an average of 10.3 days between the onset of symptoms and hospitalization. In all cases, numerous attempts at previous outpatient care/medical assistance were reported, and all without effective resolution of the condition.

The anterior mediastinum was affected in two cases, while the posterior in one. The three patients underwent a surgical procedure within 48 hours of hospital admission, all of which were performed with surgical cervicotomy with transcervical drainage of the mediastinum, and evolved with a tracheostomy at some point during hospitalization, converted to right posterolateral thoracotomy. The indication for tracheostomy was based on the characteristics of the evolution of the condition and time of intubation



purulent cervical secretion



Transoral (A) and transcervical (B) drainage

Symptoms on admission mainly included odynophagia, fever and poor general condition. The length of hospital stay ranged from 42 to 96 days with an average (64.66 days), and in ICU 18 to 95 days (average 48.33 days).

In the initial admission screening, microbiological tests included aerobic and anaerobic cultures and were performed from blood samples and swabs of oral secretions. All had negative blood cultures. Two had a negative culture of the secretion, in only one isolated *Staphylococcus aureus*, but all had already undergone some type of oral antibiotic therapy. It is noteworthy that three evolved with a positive blood culture and/or culture of tracheal aspirate *Klebsiella pneumoniae* at some point during hospitalization, and in two there was isolation of *Acinetobacter baumannii* from tracheal secretions throughout the nosocomial period.

Antibiotic therapy was started empirically on admission, and later changed according to evolution/worsening and/or resistance results obtained in antibiograms. During hospitalization, a total of 10 different intravenous antibiotics were used (Meropenem 53 days, Polymyxin B 46 days, Teicoplanin 35 days, Vancomycin 27 days, Piperacillin Tazobactam 13 days, Levofloxacin

05 days, Amoxicillin + Clavulanate 04 days, Metronidazole 03 days, Oxacillin 02 days, Clindamycin 02 days).

In the cases cited, two patients were discharged from the hospital and are still being followed up at the outpatient clinic, while one died, assenting to literary statistics.

## DISCUSSION

Descending necrotizing mediastinitis (NDM) is a primary complication of cervical or odontogenic infections that can spread to the mediastinum through anatomical cervical spaces (L M Sancho, Minamoto H, Fernandez A, et al; Papalia E, Rena O, Oliaro A, et al). An uncommon, but one of the most serious, forms of mediastinitis is NMD, which is caused by the downward spread of deep neck infections and arises as a major complication of “banal” odontogenic, pharyngeal, or cervicofacial foci (Ridder GJ, Maier W, Kinzer S, Teszler CB, et al). In this report, all patients included the economically active population, without comorbidities, presenting themselves healthy until the onset of the condition, showing that even in the era of modern antibiotics, MND still has impressive rates of morbidity and mortality (30% to 40%), these rates have mainly been attributed to delays in diagnosis and inadequate surgical drainage (Ridder GJ, Maier W, Kinzer S, et al).

Feng CC and Lin CS. point out that the delay in the diagnosis of MND occurs mainly due to the absence of specific signs and symptoms, in addition to the use of anti-inflammatories and antibiotics, which can mask the complexity of the infection and make it clinically silent for a long period.

The gravitational force, breathing, negative intrathoracic pressure in the mediastinum and pleural cavities during inspiration, the absence of barriers in the fascial planes, as well as tissue necrosis ultimately facilitate the spread of infection to the mediastinum

(Ridder GJ, Maier W, Kinzer S, et al; Jarboui S, Jerraya H, Moussi A, et al).

Cervicotomy along with posterolateral thoracotomy incision as a transthoracic approach is currently recommended as standard treatment in MND by most authors. However, thoracotomy is a more aggressive surgical approach with the need to change the patient's operative position, which may worsen the prognosis and increase the length of hospital stay (Ridder GJ, Maier W, Kinzer S, et al).

As stated by Ridder GJ, Maier W, Kinzer S, et al. Most cases of MDN are limited to the superior mediastinum and can be adequately drained by a transcervical approach. Formal thoracotomy must be reserved for cases that extend below the plane of the tracheal bifurcation. Accordingly, in the cases reported here, we opted for the initial transcervical mediastinal approach and aimed to have it performed as early as possible, maintaining close follow-up, trying to avoid the involvement of the inferior mediastinum. We chose to reserve thoracotomy for cases where the initial approach was not sufficient or in cases where the lower limbs were involved.

According to Sandner A, Börgermann J, Kösling S, et al, subsequent extensive inflammatory changes and necroses can lead to sepsis. The fully developed condition runs a fulminant course and septic shock can develop rapidly. Delayed recognition and insufficient drainage are the main causes of high mortality.

Early diagnosis and treatment is a key prognostic factor for these very serious conditions, which are still life-threatening in 40% of cases, as reported by Jarboui S, Jerraya H, Moussi A, et al.

## CONCLUSION

Rapid suspicion and investigation is advisable and essential when serious

odontogenic/pharyngeal infections occur, since this disease can have a fulminating course, with the characteristic of spreading without respecting anatomical barriers, depending on the bacterial strains and topographies affected; causing necrosis of muscle and fascia and inducing toxicity, partly attributable to the synergistic growth of aerobic and anaerobic bacteria and partly to the limited number of immunocompetent cells in the mediastinum (Ridder GJ, Maier W, Kinzer S, et al).

MND can be potentially fatal, with repercussions on prolonged hospital stays, sometimes with cross-infection, resulting most of the time in multiple surgical approaches, with the use of multiple therapeutic schemes, which is reflected in high hospital costs, and which even despite this, it can progress to sepsis and often to death.



## REFERENCES

1. Ridder GJ, Maier W, Kinzer S, Teszler CB, Boedeker CC, Pfeiffer J. Descending necrotizing mediastinitis: contemporary trends in etiology, diagnosis, management, and outcome. *Ann Surg.* 2010 Mar;251(3):528-34. doi: 10.1097/SLA.0b013e3181c1b0d1. PMID: 19858699.
2. Papalia E, Rena O, Oliaro A, Cavallo A, Giobbe R, Casadio C, Maggi G, Mancuso M. Descending necrotizing mediastinitis: surgical management. *Eur J Cardiothorac Surg.* 2001 Oct; 20(4):739-42. doi: 10.1016/s1010-7940(01)00790-4. PMID: 11574217
3. Sancho LM, Minamoto H, Fernandez A, Sennes LU, Jatene FB. Descending necrotizing mediastinitis: a retrospective surgical experience. *Eur J Cardiothorac Surg.* 1999 Aug;16(2):200-5. doi: 10.1016/s1010-7940(99)00168-2. PMID: 10485421.
4. Sandner A, Börgermann J, Kösling S, Silber RE, Bloching MB. Descending necrotizing mediastinitis: early detection and radical surgery are crucial. *J Oral Maxillofac Surg.* 2007 Apr;65(4):794-800. doi: 10.1016/j.joms.2005.11.075. PMID: 17368383
5. Jarbouï S, Jerraya H, Moussi A, Ben Moussa M, Marrakchi M, Kaffel N, Haouet K, Ferjaoui M, Zaouche A. Médiastinite nécrosante descendante odontogénique [Descending necrotizing mediastinitis of odontogenic origin]. *Tunis Med.* 2009 Nov;87(11):770-5. French. PMID: 20209836.
6. Feng CC, Lin CS. Descending Necrotizing Mediastinitis Mimics Upper Respiratory Tract Infection. *J Acute Med.* 2017 Dec 1;7(4):177-178. doi: 10.6705/j.jacme.2017.0704.008. PMID: 32995194; PMCID: PMC7517945