

Mediastinitis in Children. Variants of Ultrasound Presentation (Literature Review with Their Own Clinical Observations)

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Abstract

Mediastinitis in children is an extremely rare condition and presents mainly as a descending purulonecrotic process in the context of deep odontogenic inflammations in the neck. Another genesis of mediastinitis such as post-cardiac surgery complication is also very rare. Post-traumatic mediastinitis in children virtually does not occur. The disease is diagnosed on the basis of radiological imaging, CT definitely being the first choice. Ultrasound imaging is not mentioned as part of the diagnostic search algorithm. The publication presents 2 own observations of purulent mediastinitis in boys at the age of 8 (odontogenic mediastinitis) and 16 (post-traumatic mediastinitis) initially diagnosed by the ultrasound imaging with subsequent CT-confirmation. The cases were verified intraoperatively. Echograms are shown; imaging technical details are discussed, the publication is supplemented with a brief literature review.

Key words: Ultrasonography, Children, Mediastinitis.

References

1. *Danelian Sh. N., Abakumov M. M., Chernen'kaia T. V.* Septic complications of the closed thoracic trauma. *Khirurgiia*. 2011;(3):19–25 (in Russian).
2. *Danielian Sh. N., Abakumov M. M., Pogodina A. N., Sharifullin F. A., Barmina T. G., Kvardakova O. V., Chernen'kaya T. V.* Diagnostics and surgical treatment of the posttraumatic eptic mediastinitis. *Khirurgiia*. 2011. V. 12. No. 47–54 (in Russian).
3. *Olkhova E. B., Haspekov D. V., Topilin O. G.* Posttraumatic peripharyngeal abscess in a infant. *Radiologiya – praktika*. 2013. No. 6. P. 73–77 (in Russian).
4. *Khaspekov D. V., Olkhova E. B., Topilin O. G. et al.* Modern methods of diagnostics and treatment of destructive pneumonia in children. *Russian Journal of Pediatric Surgery, Anesthesia and Intensive Care*. 2015. V. 5. No. 2. P. 7–12 (in Russian).
5. *Al-Sehly A. A., Robinson J. L., Lee B. E., Taylor G., Ross D. B., Robertson M., Rebeyka I. M.* Pediatric poststernotomy mediastinitis. *Ann. Thorac. Surg*. 2005. V. 80. No. 6. P. 2314–20.
6. *Cortese A., Pantaleo G., Borri A., Amato M., Claudio P. P.* Necrotizing odontogenic fasciitis of head and neck extending to anterior mediastinum in elderly patients: in-

- novative treatment with a review of the literature. *Aging. Clin. Exp. Res.* 2017. V. 29 (Suppl. 1). P. 159–165.
7. *Çağlayan B., Yılmaz A., Bilaçeroğlu S., Cömert S. Ş., Demirci N. Yu., Salepci B.* Complications of convex-probe endobronchial ultrasound-guided transbronchial needle aspiration: a multi-center retrospective study. *Respir. Care.* 2016. V. 61. No. 2. P. 243–248.
 8. *Gochi F., Chen F., Aoyama A., Date H.* Mediastinal infectious complication after endobronchial ultrasound-guided transbronchial needle aspiration. *Interact. Cardiovasc. Thorac. Surg.* 2013. V. 17.No. 4. P. 751–752.
 9. *Kocher G. J., Hokschi B., Caversaccio M., Wiegand J., Schmid R. A.* Diffuse descending necrotizing mediastinitis: surgical therapy and outcome in a single-centre series. *Eur. J. Cardiothorac. Surg.* 2012. V. 42. No. 4. P. 66–72.
 10. *Lautermann J., Lehnerdt G., Beiderlinden M., Sudhoff H.* Infections of the deep neck spaces with accompanying mediastinitis. *Laryngorhinootologie.* 2005. V. 84. No. 3. P. 171–175.
 11. *Lewandowski B., Pakla P., Wolek W., Jednakiewicz M., Nicpoń J.* A fatal case of descending necrotizing mediastinitis as a complication of odontogenic infection. A case report. *Kardiochir. Torakochirurgia Pol.* 2014. V. 11. No. 3. P. 324–328.
 12. *Pinto A., Scaglione M., Scuderi M. G., Tortora G., Daniele S., Romano L.* Infections of the neck leading to descending necrotizing mediastinitis: Role of multi-detector row computed tomography. *Eur. J. Radiol.* 2008. V. 65. No. 3. P. 389–394.
 13. *Pota V., Passavanti M. B., Sansone P., Pace M. C., Peluso F., Fiorelli A., Aurilio C.* Septic shock from descending necrotizing mediastinitis – combined treatment with IgM-enriched immunoglobulin preparation and direct polymyxin B hemoperfusion: a case report. *J. Med. Case Rep.* 2018. V. 3. No. 12 (1). P. 55.
 14. *Roccia F., Pecorari G. C., Oliaro A., Passet E., Rossi P., Nadalin J., Garzino-Demo P., Berrone S.* Ten years of descending necrotizing mediastinitis: management of 23 cases. *J. Oral. Maxillofac. Surg.* 2007. V. 65. No. 9. P. 1716–1724.
 15. *Sarna T., Sengupta T., Miloro M., Kolokythas A.* Cervical necrotizing fasciitis with descending mediastinitis: literature review and case report. *J. Oral. Maxillofac. Surg.* 2012. V. 70. No. 6. P. 1342–1350.
 16. *Sumi Y.* Descending necrotizing mediastinitis: 5 years of published data in Japan. *Acute Med. Surg.* 2014. V. 26. No. 2 (1). P. 1–12.
 17. *Tortoriello T. A., Friedman J. D., McKenzie E. D., Fraser C. D., Feltes T. F., Randall J., Mott A. R.* Mediastinitis after pediatric cardiac surgery: a 15-year experience at a single institution. *Ann. Thorac. Surg.* 2003. V. 76. No. 5. P. 1655–1660.
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