

CASE REPORT

CT-guided percutaneous drainage of an anterior mediastinal abscess with a 16 F catheter

P.A. Gevenois*, G. Sergent*, M. DE Myttenaere**,
A. Beernaerts+, P. Rocmans**

CT-guided percutaneous drainage of an anterior mediastinal abscess with a 16 F catheter. P.A. Gevenois, G. Sergent, M. DE Myttenaere, A. Beernaerts, P. Rocmans. ©ERS Journals Ltd 1995.

ABSTRACT: We report a case of anterior mediastinal abscess treated by percutaneous drainage under computed tomography (CT) guidance.

The relationships of the abscess to the adjacent organs were clearly delineated by an intravenous injection of contrast material, and the drain was inserted between the sternum and the vasa thoracica interna. Selection of this route and the choice of a large-bore catheter (16 F) are discussed.

Eur Respir J., 1995, 8, 869–870.

Depts of *Radiology and **Thoracic Surgery, Hôpital Erasme, Brussels, Belgium. Depts of **Internal Medicine and +Surgery, Hôpital de Waterloo, Braine L'Alleud, Belgium

Correspondence: P.A. Gevenois, Dept of Radiology, Hôpital Erasme, Route de Lennik, 808 1070 Brussels, Belgium

Keywords: Abscess, computed tomography, interventional procedures, mediastinum, percutaneous drainage

Received: September 21 1994

Accepted after revision January 23 1995

Percutaneous drainage of abscesses of the chest and empyema has been widely described [1–6], but few cases of mediastinal drainage have been reported, and only 8.3 F "pigtail" nephrostomy catheters have been used for percutaneous drainage of anterior mediastinal abscesses [7, 8]. We report the case of a young man successfully treated for an anterior mediastinal abscess by using a 16 F drainage device percutaneously placed under computed tomographic (CT) guidance.

Case report

Seven days after the surgical drainage of a post-pharyngitis cervical suppurative inflammation, a 22 year old man with retrosternal pain and a persistent inflammatory syndrome was referred to our institution for surgery. CT demonstrated a water-like mass, surrounded by an enhanced

capsule, lying in the anterior mediastinum. During a second surgical procedure, finger exploration of the superior mediastinal space extracted a purulent collection extending downwards to the aortic arch. Several drains were inserted into the anterior cervicomediastinal abscess.

Two days later, a CT scan demonstrated the persistence of a residual retrosternal fluid collection, not drained by the tubes (fig. 1). The relationships of the abscess to the adjacent structures and, mainly, to the vasa thoracica interna were clearly delineated after an intravenous injection of 50 ml of ionic contrast medium (fig. 1). Under CT guidance, an 18 G needle was introduced between the sternum and the vasa thoracica interna and directed towards the collection. After aspiration of 20 ml of viscous pus, a floppy-tip 0.038 J guidewire was then inserted through the needle, and the pathway was enlarged with dilators of sizes increasing up to 18 F. Finally, a 16 F multi-perforated single lumen drain was positioned and fixed to the skin of the patient and frequently rinsed (fig. 2). Bacterial analysis revealed the presence of *Streptococcus viridans* species.

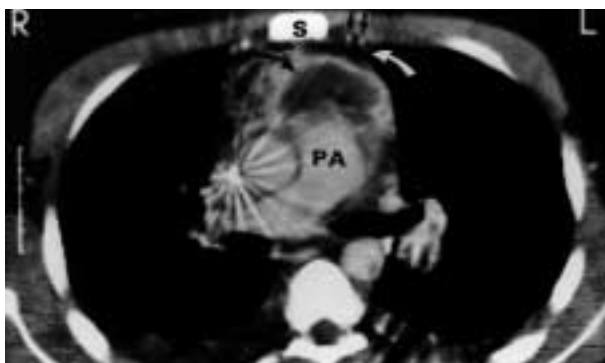


Fig. 1. – Enhanced computed tomography (CT) demonstrates a low-density mass surrounded by a high-density capsule (black curved arrow) in front of the pulmonary artery (PA). The vasa thoracica interna are enhanced (straight arrows) and located at some distance from the lateral edge of the sternum (S). The anterior junction line is enlarged and the anterior margin of the left lung displaced laterally (white curved arrow).

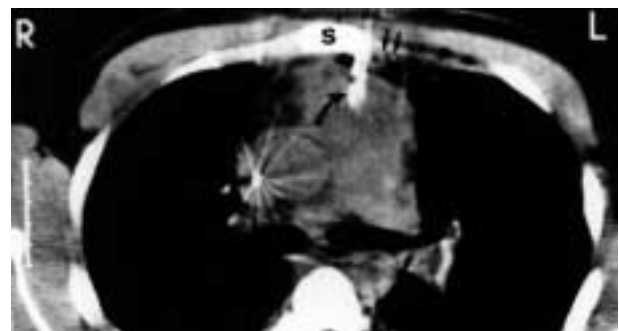


Fig. 2. – A 16 F drain (curved arrow) is percutaneously positioned between the sternum (S) and the vasa thoracica interna (straight arrows).

Clinical improvement was obvious and, 4 days later, a CT scan confirmed the dramatic regression of the mediastinal collection and the absence of any other residual abscess. On day 5, all drains were almost dry and were removed. On day 8, the patient was discharged with a treatment of amoxicillin for 10 days. Two months later, the patient was asymptomatic and CT control revealed a normal mediastinum.

Discussion

Infection of the mediastinal space is a serious and potentially fatal process. Most patients require debridement of infected tissue, and surgical drainage associated with appropriate antimicrobial therapy [9]. In the present case, the suprasternal incision was insufficient to drain a collection extending downwards in the mediastinum. Median sternotomy with extensive debridement is indicated in case of acute septicaemia with septic shock. This direct surgical approach provides an excellent exposure of the whole anterior mediastinum but may disseminate the infection locally, both in pleura and in the sternal margins, leading to osteitis [10]. In subacute or in chronic infection with well-limited collection, dissemination may be avoided by percutaneous drainage, as in our patient, who was initially referred for emergency sternotomy or left thoracotomy.

Percutaneous drainage has become the treatment of choice for the majority of intra-abdominal abscesses and fluid collections, and the use of large-bore drainage catheters has been recommended [11]. Percutaneous drainage of mediastinal fluid collection is a successful alternative to open drainage, but has been reported less frequently than pleural and lung drainage. MANDEL *et al.* [8] reported two patients treated for an abscess by means of a "pigtail" catheter, but did not mention the precise location of the collection in the mediastinum. GOBIEN *et al.* [7] described CT-guided percutaneous aspiration of 13 mediastinal abscesses by using 8.3 F "pigtail" catheters. These abscesses were located in various compartments of the mediastinum, but none of them was anteriorly located. In this series, two patients had a persistent cavity in the right middle mediastinum, despite adequate tube position, requiring insertion through a posterior path of larger drains, up to 14 F. The duration of the drainage should be as short as possible in order to avoid injury to mediastinal vessels caused by a long-standing catheter. For that purpose, a large bore catheter, allowing rapid evacuation of the thick pus and early collapse of the cavity, was used in the present case. In addition, insertion of such a catheter during the initial procedure may also improve drainage enough to induce septate fractures and avoid further management of a multiseptated abscess [12].

Selection of a safe route is one of the most important aspects of the procedure of percutaneous drainage [13]. The optimal pathway should be as direct and short as possible, but it must also spare important anatomical structures. In the presence of an anterior mediastinal collection, the anterior pleural junction line is enlarged, resulting in a lateral displacement of the anterior aspect

of the lung (fig. 1). Consequently, the position of the drain is far from the pleura and from the adjacent lung. By avoiding passage of the drain through the pleura and the lung, we may prevent possible infection of these organs. Nevertheless, the drain must be placed as medially as possible, in order to clear the anterior margin of the lung that moves medially as the volume of the mediastinal collection decreases. Consequently, we preferred to insert the drain between the sternum and the vasa thoracica interna. For that purpose, contrast enhanced CT is necessary to clearly identify these vessels (fig. 2). Furthermore, bolus contrast enhancement determines a perfect delineation of the pulmonary artery and shows the relationships between this vessel, the abscess and the drain.

In summary, our reported case shows that an anterior mediastinal abscess can be rapidly and successfully treated by CT-guided percutaneous drainage with a large-bore catheter, and that recognition of vessels by injection of iodinated contrast material makes the procedure safe.

References

1. Cameron EWJ, Whitton ID. Percutaneous drainage in the treatment of *Klebsiella pneumoniae* lung abscess. *Thorax* 1977; 32: 673-676.
2. Vainrub B, Musher DM, Guinn GA, Young EJ, Septimu EJ, Travis LL. Percutaneous drainage of lung abscess. *Am Rev Respir Dis* 1978; 117: 153-160.
3. Aronberg DJ, Sagel SS, Jost RG, Lee JJ. Percutaneous drainage of lung abscess. *Am J Roentgenol* 1979; 132: 282-283.
4. Weissberg D. Percutaneous drainage of lung abscess. *J Thorac Cardiovasc Surg* 1984; 87: 308-312.
5. Stavos J, van Sonnenberg E, Casola G, Wittich GR. Percutaneous drainage of infected and noninfected thoracic fluid collections. *J Thorac Imag* 1987; 2: 80-87.
6. van Sonnenberg E, D'Agostino HB, Casola G, Wittich GR, Varney RR, Harker C. Lung abscess: CT-guided drainage. *Radiology* 1991; 178: 347-351.
7. Gobien RP, Stanley JH, Gobien BS, Vuyic I, Pass HI. Percutaneous catheter aspiration and drainage of suspected mediastinal abscesses. *Radiology* 1984; 151: 69-71.
8. Mandel SR, Boyd D, Jaques PF, Mandell V, Staab EV. Drainage of hepatic, intra-abdominal, and mediastinal abscesses guided by computerized axial tomography. *Am J Surg* 1983; 145: 120-125.
9. Davis RD, Oldham HN, Sabiston DC. The mediastinum. In: Sabiston DC, Spencer FC, eds. *Surgery of the Chest*. Philadelphia, WB Saunders, 1990; pp. 498-535.
10. Borrie J. Mediastinal emphysema and suppurative mediastinitis. In: Borrie J, ed. *Management of Thoracic Emergencies*. 3rd Edn. New York, Appleton-Century Crofts, 1980; pp. 373-382.
11. Van Gansbeke D, Matos C, Gelin M, Müller P, Zalman M, Devière J, Struyven J. Percutaneous drainage of subphrenic abscesses. *Br J Radiol* 1989; 62: 127-133.
12. Lieberman RP, Hahn FJ, Imray TJ, Phalen JT. Loculated abscesses: management by percutaneous fracture of septations. *Radiology* 1986; 161: 827-828.
13. van Sonneberg E, Ferrucci JT Jr, Mueller PR, Wittenberg J, Simeone JF. Percutaneous drainage of abscesses and fluid collections: technique, results and applications. *Radiology* 1982; 142: 1-10.