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CASE REPORT

Tracheocele: a rare cause of difficult endotracheal intubation and subsequent pneumomediastinum

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Tracheocele: a rare cause of difficult endotracheal intubation and subsequent pneumomediastinum. G.M. Möller, E.J.F.M. ten Berge, C.M. Stassen. ©ERS Journals Ltd 1994.

ABSTRACT: A case is described in which accidental perforation of a tracheocele caused by endotracheal intubation resulted in a postoperative pneumomediastinum. The tracheocele, an extremely rare finding in clinical anaesthesia, was confirmed radiologically and for the first time demonstrated by computed tomography.

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A tracheocele is extremely rare, and only a few cases have been described in the literature [1–3]. We report a case of accidental perforation of a tracheocele, caused by endotracheal intubation, which resulted in severe postoperative pneumomediastinum. This case is the first report of a tracheocele during anaesthesia confirmed by computed tomography (CT).

Case report

In May 1991, a 90 year old female, with no history of pulmonary disease, was admitted for a total hip procedure under general anaesthesia. The intubation with an endotracheal tube, 8 mm internal diameter, by the anaesthesiologist was difficult. Postoperatively the patient developed dyspnoea, a productive cough, and retrosternal pain; but no fever. Physical examination revealed subcutaneous crepitus in the upper body. Chest X-rays showed extended mediastinal and subcutaneous emphysema, but pneumothorax was not seen. Probably the air-leakage within the planes of the mediastinum was secondary to a perforation. Bronchoscopy showed an opening during inspiration of approximately 0.5 cm at broadest diameter, and 2.5 cm in length, about 4 cm below the true vocal cords in the posterior wall of the trachea, which led to an air-filled diverticulum. This appeared to collapse during expiration. Conventional tracheobronchography also showed a wide opening in the posterior wall of the trachea (fig. 1).

Serial CT-scans of the neck and mediastinum after tracheography revealed an opening in the posterior wall at the level of the one-third upper segment of the trachea (fig. 2).

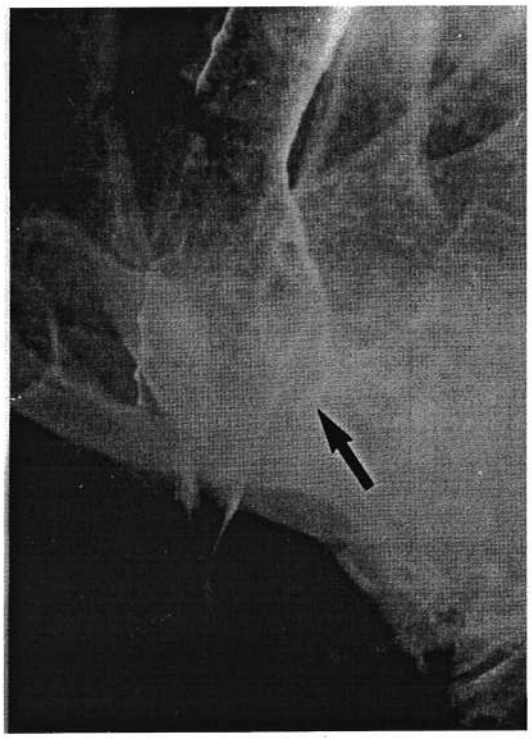

Fig. 1. – (Contrast) tracheobronchogram in the lateral projection demonstrates a tracheocele with a large opening.

The patient was treated with broad spectrum antibiotics to avoid mediastinitis. The patient's postoperative course was uneventful, and no signs of mediastinitis were observed. The subcutaneous emphysema disappeared completely in a few days.

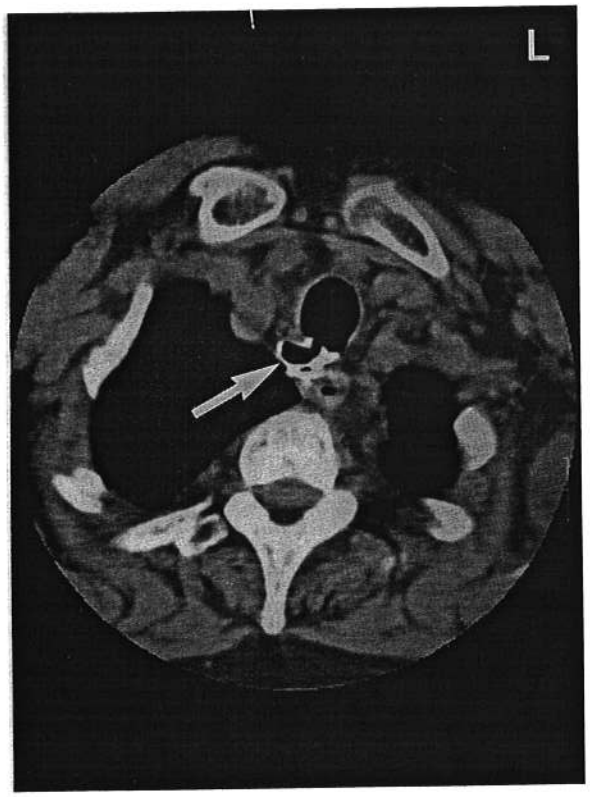

Fig. 2. – Computed tomographic (CT)-scan of the mediastinum, after contrast tracheobronchography, demonstrates a tracheocele from the posterior wall of the trachea (arrow).

Discussion

Tracheoceles are extremely rare, but their real incidence is not known [1–3]. In a study of tracheal anatomy, MILLER [4] described the trachealis muscle as consisting of transverse bands which unite with the cornua of the cartilage semi-rings. Between these bands of muscle lie amuscular areas. Development of diverticula in these relatively weak areas seems quite feasible, especially if there is an infection of the mucous membrane and chronic cough with increased intrabronchial pressure. STIBBE [5] stated that the diverticula with wide openings are acquired, and that the congenital type has a narrow mouth. According to his criteria, our patient should be considered to have an acquired defect in the posterior tracheomusculature. Since she had no pulmonary symptoms or history of pulmonary disease, recognition was accidental. Examination carried out afterwards revealed a tracheocele, and its perforation had caused the pneumomediastinum. Difficulty in endotracheal intubation is not uncommon, and can arise from the inability to visualize the larynx and/or from an obstruction of the passage of the tracheal tube [6]. The incidence of complications varies with the patient population, skill of the laryngoscopist, and conditions under which endotracheal intubation is performed. To our knowledge, no fatal issues have been reported. However, a tracheocele is not always as harmless as in our case. Chronic cough due to an overflow into the bronchi is reported [3, 7], because the tracheocele is capable of retaining a large amount of purulent secretion.

In such cases, resection of the tracheocele is necessary to eliminate "dumping" of purulent secretion into the tracheobronchial tree, and to avoid aspiration pneumonias.

Our case is the first report of a tracheocele in clinical anaesthesia to be confirmed by CT. CT-scan and bronchography can both demonstrate a tracheocele. However, in case of unexplained postoperative pneumomediastinum CT-scan is a better alternative, because it is a quick, nontoxic and noninvasive investigation [8].

For future anaesthetic management of a patient with a tracheocele, performing the intubation under bronchoscopic surveillance is indicated to prevent the tube from perforating through the bottom of the tracheocele.

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