Journal of Pediatric Surgery (2005) **40**, E35–E36

ELSEVIER

Journal of Pediatric Surgery

www.elsevier.com/locate/jpedsurg

Thoracoscopic ligation of a tracheoesophageal H-type fistula in a newborn

Gaber Abdel Aziz, Felix Schier*

Department of Pediatric Surgery, University Medical Center, Mainz, Germany

Index words:
Thoracoscopy;
H-type fistula;
Thoracoscopic repair;
2-mm instruments

Abstract An H-type fistula represents the isolated form of tracheoesophageal fistula, and it is relatively uncommon. Conventional thoracotomy is associated with significant late sequelae; scapula alata, scoliosis, and excessive scarring [Konkin DE, O'hali WA, Webber EM, Blair GK. Outcomes in esophageal atresia and tracheoesophageal fistula. J Pediatr Surg 2003;38:1726-9]. Thoracoscopic approaches avoid these consequences. Thoracoscopic repair of esophageal atresia, together with fistula ligation, has been performed earlier [van der Zee DC, Bax NM. Thoracoscopic repair of esophageal atresia with distal fistula. Surg Endosc 2003;17:1065-7]. Thoracoscopic repair of H-type fistula was not attempted before. This is probably because most H-type fistulas are high enough to be accessible through a neck incision. Low fistulas are better approached via the thorax. To our knowledge, this is the first report of a thoracoscopic approach to an H-type tracheoesophageal fistula in a newborn.

1. Case report

A 2-month-old baby born at 38 weeks of gestation was referred to surgery because of feeding difficulties with frequent regurgitation, together with respiratory problems since the 10th day of life. The esophagogram revealed a low H-type fistula, 1.5 vertebral bodies above the tracheal bifurcation, that is, between T2 and T3 (Fig. 1). A 5-mm 0-degree thoracoscope was introduced at the anterior axillary line at the level of the lower angle of the scapula. CO_2 was insufflated at a rate of 0.3 L/min up to a pressure of 8 mm Hg. The lung readily collapsed and remained collapsed throughout the procedure with almost no need for further insufflation. Two additional 2-mm trocars were inserted 3 cm to the left and the right of the thoracoscope. First, the vena azygous was doubly ligated and divided. Then, the fistula was traced cranially by bluntly separating the esophagus and trachea starting from the tracheal bifurcation until it was identified (Fig. 2) and doubly ligated with 3/0 slow-absorbable and 3/0 monofilamentous nonabsorbable material without division (Fig. 3) Division was refrained from being performed in the hope to avoid stridor which may occur in cases of concealed tracheomalacia. All ligatures were done by intracorporeal knotting. The instruments and trocars were withdrawn, and the lung reinflated until it completely filled the thoracic cavity. The 5-mm incision was closed by a single absorbable subcuticular

* Corresponding author. Department of Pediatric Surgery, University Medical Center Mainz, Langenbeckstrasse 1, 55101 Mainz, Germany. Tel.: +49 6131 177111, +49 6131 172034 (Secretary), +49 179 523 1949 (Mobile).

E-mail address: schier@kinderchir.klinik.uni-mainz.de (F. Schier).

0022-3468/$ – see front matter © 2005 Elsevier Inc. All rights reserved.
doi:10.1016/j.jpedsurg.2005.03.037

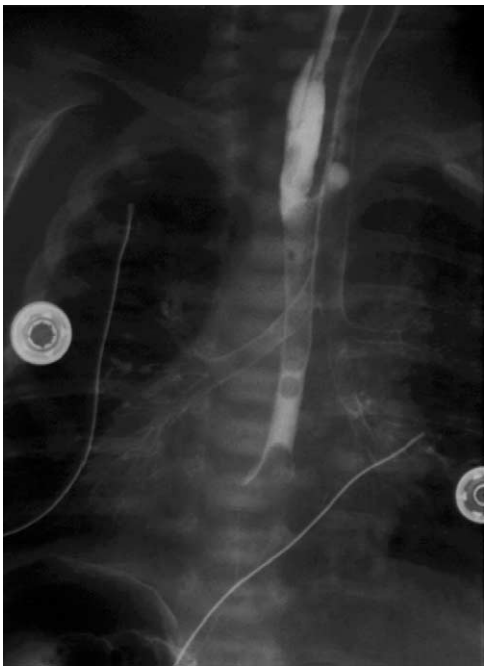

Fig. 1 Contrast study demonstrating the fistula between trachea and esophagus.

suture; Steri Strips only were applied to the other incisions. No chest tube was inserted. The baby was transferred to the intensive care unit. The endotracheal tube was removed on the same night without stridor. Oral feedings were allowed on the first postoperative day, and the baby was discharged on the third day. The preoperative regurgitation disappeared, and the baby did well thereafter.

2. Discussion

H-type tracheoesophageal fistula is rare. In most of the cases, it is readily accessible through the neck, and rarely, it is as low to require thoracotomy [1]. A fistula as low as in the present case lends itself to thoracoscopic ligation. Open ligation for such a low fistula would have caused more access trauma. Previously, procedures have progressed from simple bronchoscopy or esophagoscopy to the passage of rubber catheters through the fistula, to the current passage of guide wires alone or guided by fluoroscopy [2]. However, the magnification and better illumination provided by thoracoscopy made it easier to identify the fistula even without putting a guide inside the esophagus. Moreover, thoracoscopy made it easy to identify other anatomical structures around the fistula, namely, the vagus and the recurrent laryngeal nerves. In contrast to open surgery, the lung was hardly touched and remained mechanically unharmed throughout the whole procedure. Postoperative inflation was easy, and no chest tube was necessary. Because of the absent trauma of thoracotomy, postoperative recovery was prompt. The cosmetic result is excellent. Late sequelae of thoracotomies are hopefully avoided. The authors are uncertain about the necessity of division of the fistula. Simple ligation was preferred in the present case out of safety considerations; suturing of a tracheal leak is not easy thoracoscopically in a newborn. Moreover, our impression is that an undivided fistula may stabilize the soft trachea and reduce the likelihood of postoperative stridor [3].

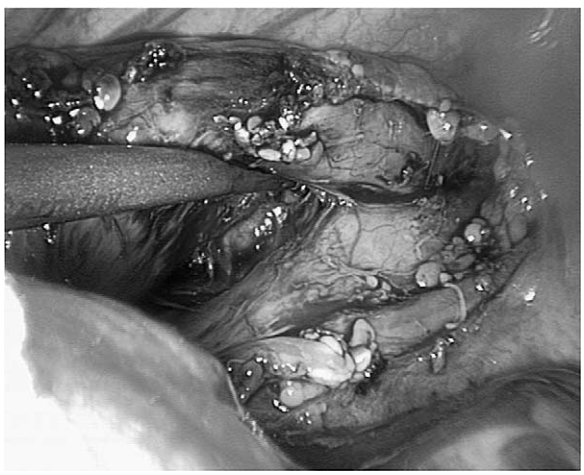

Fig. 2 The fistula identified.

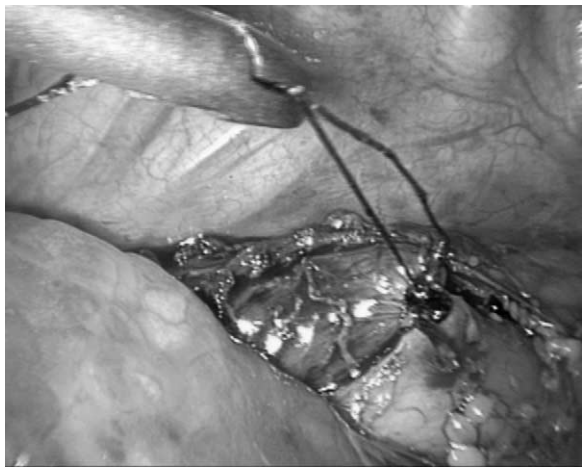

Fig. 3 Fistula ligated.

References

[1] Butterworth SA, Webber EM, Jamieson DH. H-type tracheoesophageal fistula. J Pediatr Surg 2001;36:958-9.

[2] Ko A, DiTirro FR, et al. Simplified access for division of the low cervical/high thoracic H-type tracheo-esophageal fistula. J Pediatr Surg 2000;35:1621-2.

[3] Wiersbitzky S, Heydolph F, Ballke EH, et al. High-grade tracheomalacia and tracheal stenosis in congenital esophageal atresia with lower esophagotracheal fistula (type III b). Pneumologie 1990;44:1177-9.