Journal of Pediatric Surgery (2013) **48**, 525–532

ELSEVIER

Journal of Pediatric Surgery

www.elsevier.com/locate/jpedsurg

Functional, motor developmental, and long-term outcome after the component separation technique in children with giant omphalocele: A case control study

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Received 8 April 2012; revised 4 August 2012; accepted 8 August 2012

Key words:
Giant omphalocele;
Component separation technique;
Functional and motor development;
Ultrasound;
Long-term outcome

Abstract

Background/Purpose: The objective of this study was to evaluate the long-term functional and motor development and abdominal muscle quantity in children operated on for giant omphalocele (GOC) with the Component Separation Technique (CST).

Methods: Between 2004 and 2007, CST was applied in eleven consecutive infants with GOC. Eight underwent ultrasound of the abdominal wall and muscles, assessment of functional and motor development using the Movement Assessment Battery for Children, 2nd Edition (M-ABC-2), and an observational physical examination focused on possible abnormalities in stature and movements related to GOC. Findings were compared with those in age-matched controls. The parents filled in a questionnaire on the children's functioning in daily life.

Results: The mean age at evaluation was 71 months (range, 42–141 months) with a median time of follow-up of 54 months (range, 38–84 months). Ultrasound of the abdominal wall muscles showed normal muscle thickness. In seven of the eight children, a rectus diastasis was seen without any protrusion. The MABC-2 was within the normal range, and stature and motor coordination did not differ from those in controls.

Conclusions: After 4.5 years, these children show normal thickness of all abdominal wall muscles and motor function within the normal range, despite a rectus diastasis. The CST seems to be a promising closure technique for GOC.

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0022-3468/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.jpedsurg.2012.08.010

Giant omphalocele (GOC) is a congenital midline abdominal wall defect with herniation of abdominal contents, including the liver, into a membrane-covered sac. Regardless of the size of the defect, the abdominal musculature is present. The rectus abdominis muscle and the rectus sheath are normally intact but lateralized. This makes it possible to repair the abdominal wall with the so-called component separation technique (CST), i.e. after primary epithelialization of the omphalocele [1]. This technique was introduced by Ramirez et al. [2] in 1990 to repair large midline abdominal wall defects in adults without the use of prosthetic material. It is based on enlargement of the abdominal wall surface by translation of the muscular layers without compromising the innervation and blood supply of the muscles (Fig. 1). The first step is the dissection of the skin and subcutaneous fat from the abdominal wall muscles (Fig. 1A). Second, the aponeurosis of the external oblique muscle is incised approximately one centimeter of the lateral border of the rectus abdominis muscle and the aponeurosis is transected longitudinally over its full length (Fig. 1B). Transection includes the muscular part of the external oblique muscle on the thoracic wall (Fig. 1C). Finally, the external oblique muscle is separated from the internal oblique muscle in the avascular plane between both muscles up to the midaxillary line (Fig. 1D). As a result, the external oblique muscle lays lateral to the other abdominal muscles (Fig. 1E). We have been applying CST in children with GOC and the short-term results were promising. Here we report a

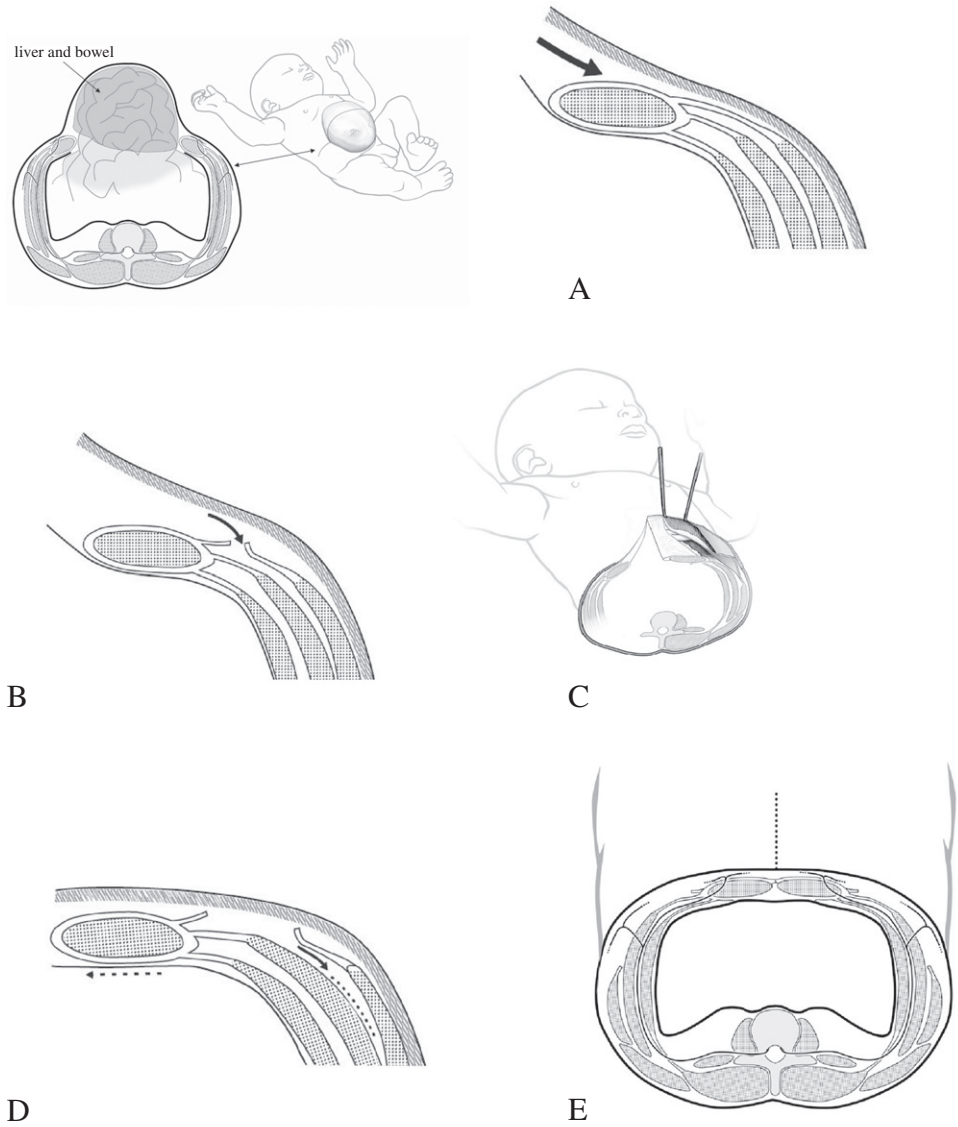

Fig. 1 The description of the components separation technique in children with a giant omphalocele. A newborn after epithelialization of the giant omphalocele. (A) Dissection of the skin and subcutaneous fat from the abdominal wall muscles. (B) Incision of the aponeurosis of the external oblique muscle 1 cm lateral of the rectus sheath. (C) Transection includes the muscular part of the external oblique muscle on the thoracic wall. (D) Separation of the external and internal oblique muscles. (E) After closure of the abdomen, the external oblique muscle is retracted laterally.