PRIMARY ANASTOMOSIS USING PLEDGET-REINFORCED HORIZONTAL MATTRESS SUTURES IN LONG GAP GROSS TYPE-C ESOPHAGEAL ATRESIA

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Introduction

Primary repair of esophageal atresia (EA) always represents challenges for pediatric surgeons when the two esophageal ends are too far apart for primary anastomosis (1). Although the "long-gap" in proximal esophageal atresia and distal tracheaesophageal fistula (TEF) has not been clearly defined, we preferred a functional description of "long-gap". It represents a gap of such length that primary anastomosis cannot be achieved under acceptable tension (2-4). Here, we describe a new technique using pledget-reinforced absorbable horizontal mattress sutures to perform primary anastomosis of both atretic ends in long-gap proximal EA and distal TEF.

Case	Weight (g)	Gestational age (weeks)	Aortic Arch	Thoracotomy	Gap (vertebral bodies)	Oral Feeding day	Progress
1	2695	38	Right sided	Right posterolateral	3	10	Discharged on the day 18. Currently 3 years old with no complaints.
2	2990	37	Left sided	Right posterolateral	2	None	Died on the day 3.
3	2900	39	Left sided	Right posterolateral	2	9	Discharged on the day 21. Currently 1 month old with GER.

Table 1. Data of the patients

An illustration of the described technique is shown in Figure 1. A photographic demonstration of the anastomotic steps is also presented in Figure 2.

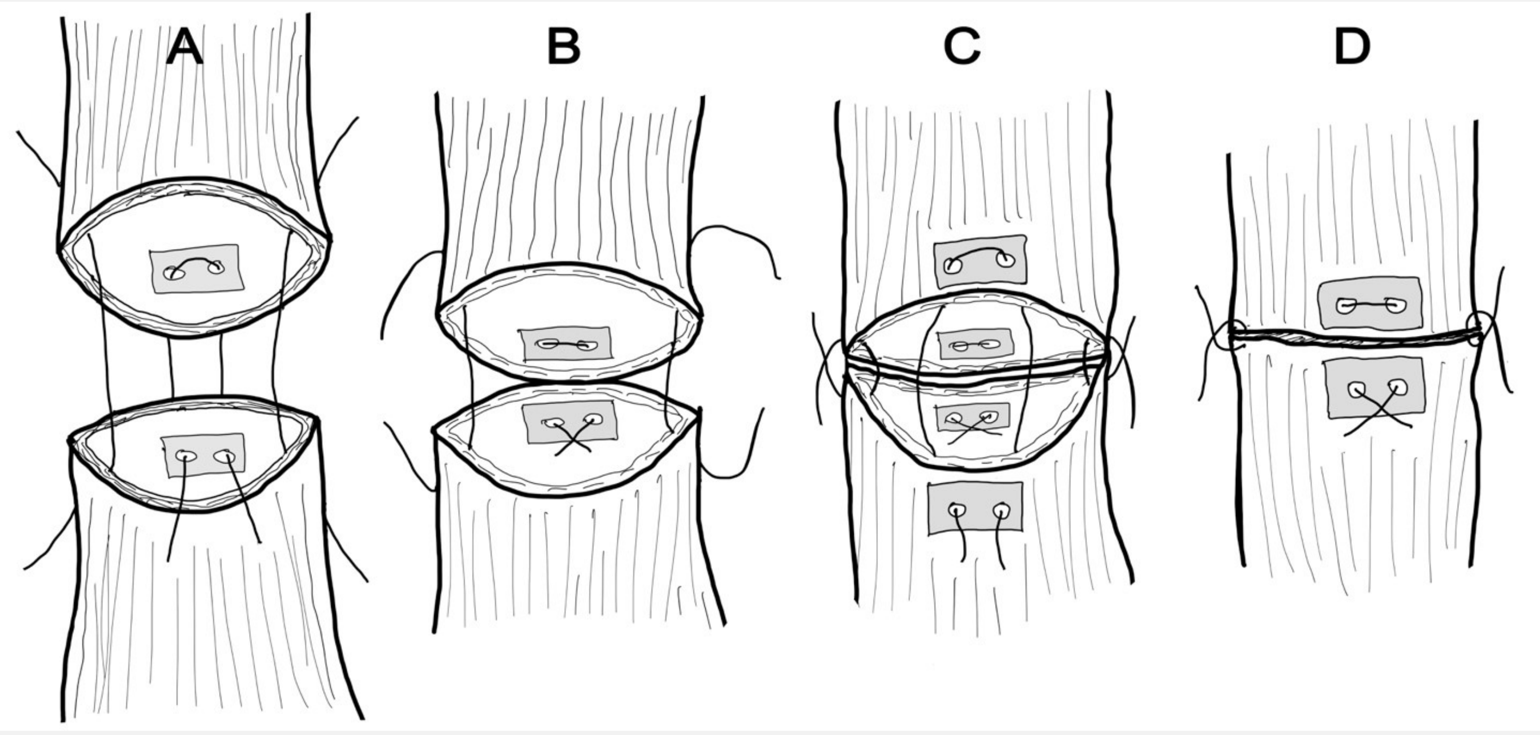

Figure 1. The illustration of the described technique

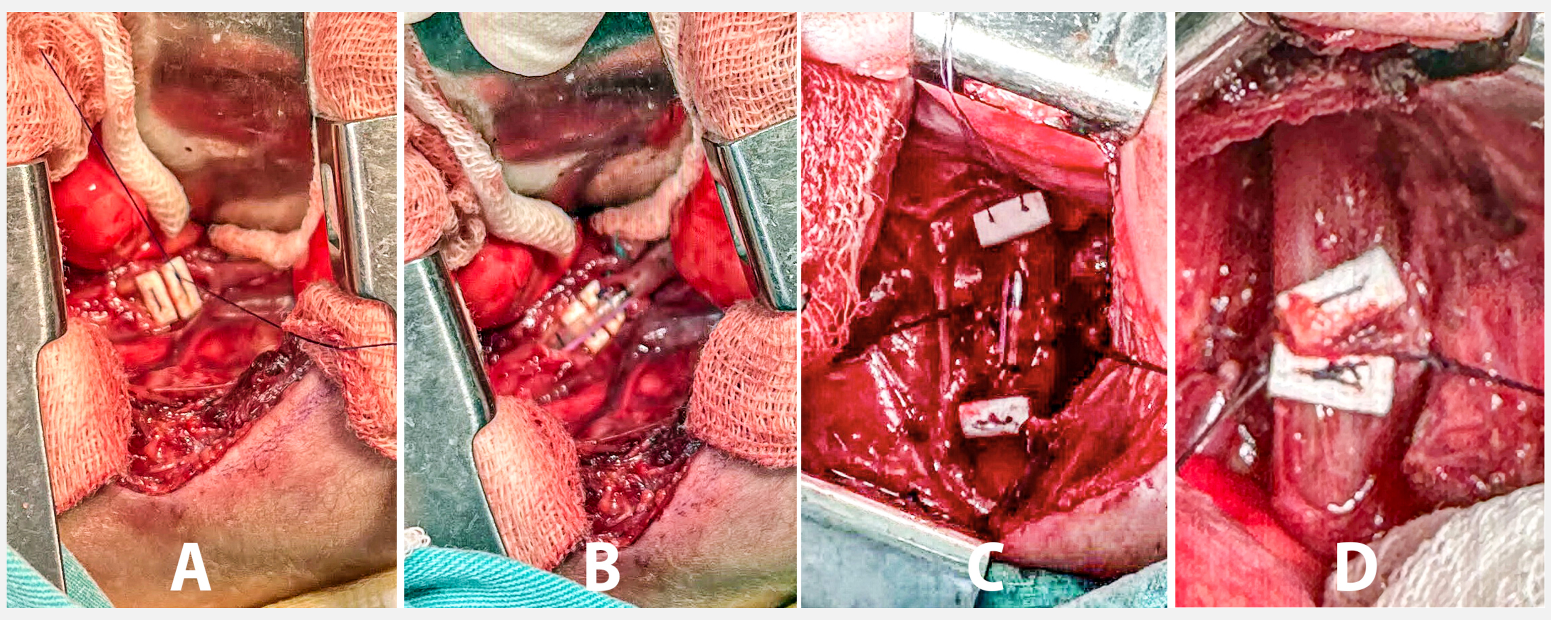

Figure 2. The anastomotic steps

In this technique, two full-thickness 4-0 polyglactin sutures are passed through as stay sutures on each side at the 3 and 9 o'clock positions. Subsequently, a horizontal mattress 4-0 polyglactin suture, reinforced with pledgets on the posterior wall of each anastomotic end, is placed and tied (***Figures 1A,2A***). Suppose the anastomotic integrity of the posterior wall is established with this suture without tearing the esophageal tissue. In that case, the two stay sutures on each side, which were passed at the beginning of the anastomosis, are tied (***Figures 1B,2B***). A trans-anastomotic tube was placed, and the anterior wall of the esophageal anastomosis was then completed in the same manner as the posterior wall, using a pledget-reinforced 4-0 polyglactin horizontal mattress suture (***Figures 1C,2C and 1D,2D***).

Discussion

Our anastomotic technique employs the same principle as the previously described techniques, using the axial-tension induced growth for esophageal lengthening to allow for primary repair by various authors such as Foker, Patkowski, Rothenberg, Van der Zee, and Kaya (4-8). Using pledgeted sutures in the Foker technique inspired us to apply the same principle to primary anastomosis (1,4). Pledget-reinforced sutures help apply axial tension on both ends to induce esophageal elongation and eliminate shear at the tissue-suture junction, thus preventing anastomotic breakdown (4,9). As a result, significant intraoperative esophageal elongation is achieved, allowing for primary anastomosis. Our anastomotic technique also eliminates the need for excessive mobilization of upper or lower esophageal segments and esophagomyotomy, jeopardizing the esophageal blood flow. It is the surgeon's choice to place a trans-anastomotic feeding tube into the stomach. We always prefer a trans-anastomotic tube in esophageal anastomosis to initiate early enteral feeding.

Conclusion

This technique was successfully performed as a primary single-stage operation in three patients, and we recommend it as the first choice over various complex multi-staged procedures for any long-gap proximal EA and distal TEF when the atretic ends can be approximated. Further studies with larger patient series are needed to clarify the advantages of this anastomotic technique over the other methods used instead.

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