Graft Telescopic Inversion Anastomosis for Acute Type A Aortic Dissection Repair

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Abstract

The remaining dissected aorta in repair of acute type A aortic dissection was approximated with two Teflon felt strips of different widths of 7 mm and 14 mm, and the graft was anastomosed with a uniformized telescopic suture technique. In hemiarch and total arch replacements to repair acute type A aortic dissection, the addition of the telescopic suture inversion technique to the approximation of the dissected aorta using two felt strips may be a secure hemostatic technique in the graft-to-aorta anastomosis.

Keywords: Aorta; Dissection; Aneurysm; Hemostasis; Suture technique

Introduction

In repairing acute type A aortic dissection, it is essential to employ the correct anastomotic technique in securing the graft to the aorta to ensure hemostasis and prevent false aneurysms. Some surgeons reinforced the friable wall of the dissected aorta with the Teflon or pericardial strips [1,2]. The graft telescopic inversion suture technique was previously presented, among various anastomosis options [3]. Here, we describe proximal and distal anastomoses in acute aortic dissection repair. First, we reinforced the friable aortic wall with two felt strips of different widths. Then, we performed a uniform graft telescopic inversion suture.

Surgical Techniques

The right axillary artery was cannulated for a cardiopulmonary bypass. During systemic cooling, the ascending aorta was cross-clamped and transected. After a retrograde blood cardioplegia into the coronary sinus, the ascending aorta was trimmed at 1.5 cm to 2.0 cm above the three commissures. The dissected commissures were reattached to the adventitia using pledgeted 4-0 polypropylene mattress sutures. In patients with deep dissection into sinuses, we packed a 4- × 4-in gauze in the coronary sinus, the ascending aorta was trimmed at 1.5 cm to 2.0 cm above the three commissures.

For hemiarch replacement, the inferior half of the arch was reinforced with two strips and suture (Figure 1A). A 3 mm to 4 mm non-reinforced aortic wall was left after trimming. A 26-mm Hemashield graft (Maquet Getinge Group, Rastatt, Germany) was anastomosed to the reinforced arch with a continuous 3-0 polypropylene over-and-over suture (Figure 1A). Briefly, the graft was sutured with a simple stitch in the most profound posterior aspect of the arch and tied. Continuous sutures were then applied to each lateral aspect of the graft. The length of each stitch was 7 mm, which was the width of the inner strip, and the stitch interval was 5 mm to 6 mm, which was just less than the stitch length (Figure 1A). The superficial and deep stitches did not pass the inner strip; instead, they passed along the upper and lower margins alongside the inner strip. For total arch replacement, the descending aorta was reinforced with the same technique; then the graft was anastomosed with a telescopic inversion suture. During rewarming, we anastomosed the proximal end of the graft to the prepared proximal ascending aorta with another graft telescopic inversion suture (Figure 1B-1D and Figure 2). Since 2016, we used this anastomotic technique in 25 consecutive patients who required acute aortic dissection repair (n=20 hemiarch replacement and
n=5 total arch replacements). None required re-exploration due to bleeding. One patient died in the hospital.

**Discussion**

The graft telescopic inversion technique had already been described [3]. We reinforced the friable intima of the dissected aorta with an additional inner felt strip, as described previously [1]. Due to the narrow, 7-mm wide inner strip, each continuous stitch was a constant 7 mm in length. The inverted graft covered the inner strip, which prevented strip exposure to the bloodstream. Additional sutures were rarely needed for hemostasis. The 5 mm to 6 mm stitch spacing was not difficult to maintain, because the spacing was slightly smaller than the 7-mm stitch length, and the upper aortic stitches were not a waste of time.

**References**

