



A Safe and Innovative Method to Apply Venous Coupler in Oncologic Head and Neck Reconstruction

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Abstract

Keywords

- ▶ venous anastomosis
- ▶ coupler
- ▶ twist

Venous anastomosis with a coupler device is an effective alternative to the hand-sewn anastomosis technique. Twist in the veins following a coupler anastomosis is a troublesome complication that needs a revision of venous anastomosis. The author proposes a simple technique to reduce the incidence of this complication. This technique is particularly useful in head and neck reconstruction and for beginners in the initial part of the learning curve.

Introduction

Venous anastomosis is one of the most critical steps in the overall success of microvascular surgery. Microvascular anastomotic coupler device (MACD) is an effective alternative to hand-sewn (HS) anastomosis.¹ The distinct advantages are complete eversion of the vessel wall, and avoiding luminal collapse by the external stent effect provided the rigid framework. The vessel's spasm is prevented and the chances of the intimal tears are lesser. All these effects contribute to the lesser incidence of venous thrombosis in the postoperative period.² In addition to this, the venous anastomosis with MACD is faster compared with the HS.

Given the advantages, MACD is associated with complications like twisting of the vein due to improper application. In the former case, the venous compromise is evident either in intraoperative or in the early postoperative period. The venous anastomosis has to be revised to salvage the flap. Improper application of the coupler is more likely in the head and neck reconstruction due to the position of anastomosing veins in the different planes and directions. The proposed technique aims to avoid improper placement and twisting of the vein.

Idea

Before venous anastomosis with the MACD, both the donor and the recipient vein clamps are removed sequentially; this

allows unfurling of any preexisting twist and helps in accurate planning. Under the microscope, the lumen was flushed with heparinized saline, and minimal adventitial preparation was done. Both the donor and the recipient veins were marked at 0 and 180 degrees (3 and 9 O'clock) for appropriate alignment (▶ **Video 1**). Appropriate-size MACD was chosen and the donor vein edge was impaled onto the coupler ring such that the prior marked areas were matched to the 3 and 9 O'clock pins on the coupler ring (0 and 180 degrees, respectively). Similarly, the recipient vein was fixed and the anastomosis was completed. The above-mentioned procedure applies to both end-to-end and end-to-side anastomosis.

Video 1

The authors innovative technique of applying venous coupler. Online content including video sequences viewable at: <https://www.thieme-connect.com/products/ejournals/html/10.1055/s-0043-1774790>.

Discussion

Improper alignment of the vein wall edge onto the coupler pins would lead to a twist in the vein leading to venous

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obstruction and flap compromise. Unfortunately, many times, the twist is appreciated only after the completion of the anastomosis. Significant twisting in the vein cannot be rectified by derotating and suture anchorage. In such scenarios, the venous anastomosis has to be revised.

Though the incidence of these complications is reduced with experience, these issues happen once in a while even in experienced hands. Umezawa et al³ reported that 100% of the complications associated with MACD were due to twisting in the vein due to improper coupler placement.

The proposed technique ensures that the coupler is properly placed, avoiding twisting of the vein. The technique is beneficial to beginners in the early stages of the learning curve. This technique helps in improving the safety of venous couplers in head and neck reconstruction. In the past 2 years, the technique was used in more than 50 cases and the author noticed the reliable and consistent placement of the coupler without any incident of twist. None of the cases needed re-exploration, and neither there was any flap loss.

Ethical Approval

The author confirms to the Declaration of Helsinki.

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