

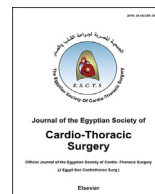
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2-Octyl Cyanoacrylate (Dermabond®) skin adhesive versus polyglactin for skin closure in endoscopic radial artery harvesting



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ABSTRACT

Background: As the goal of endoscopic conduit harvesting is to decrease pain and better cosmetic appearance, and as the optimal choice of skin closure after endoscopic radial artery harvesting (ERAH) has not yet been determined, we started this study with an aim to compare wound complications, patient satisfaction and scar healing between glue (Dermabond) versus polyglactin intra-cuticular suture for skin closure after ERAH.

Methods: This observational study was done at Al Dabbous Cardiac Center, Kuwait, from January 2017 till October 2017 enrolling 40 patients divided into two equal groups (Dermabond group and sutures group). Inclusion criterion was patients underwent coronary artery bypass grafting (CABG) using ERAH, while open technique for radial artery harvesting and Negro race are considered as exclusion criteria. Demographic data were collected, (gender, age, race, body mass index (BMI), preoperative medication and albumin level, as well as diabetes or peripheral vascular disease. Operatively, wound closure time was calculated for all patients. Postoperatively: Cosmetic appearance was assessed using the Hollander scale. Patient satisfaction was recorded at week 6–8 weeks.

Results: Demographic and preoperative data were comparable; Dermabond group showed shorter closure time, better scar pigmentation, shape and patient satisfaction. Pain, scar size, infection and hematoma showed no statistical difference.

Conclusion: Dermabond can be used safely in closure of skin after ERAH. The excellent results in the small wound of ERAH encouraged us to use it in larger wounds.

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1. Introduction

Since the publication of the first endoscopic great saphenous vein harvesting (EVH) in 1996, EVH increased in popularity and is becoming the preferred method of great saphenous vein graft (SVG) harvesting. A significant number of studies have demonstrated short term advantages of EVH as less wound morbidity, less pain, better cosmetic results, and improved patient satisfaction relative to open technique for SVG harvesting (OVH) [1].

In patients undergoing coronary artery bypass grafting (CABG), radial arteries are the conduit graft of choice after internal thoracic arteries because of their relatively easy harvesting, in addition to the adoption of calcium channel blockers, which prevent vasospasm, enhanced interest in radial arteries, especially in young patients in whom exclusive arterial grafting is desirable [2].

Complications related to conventional open radial artery harvesting (RAH) are usually not negligible when they occur, and the scar of an incision extending longitudinally throughout the forearm is definitely not cosmetically appealing [2].

Nowadays, in an effort to minimize surgical trauma, development and adoption of EVH encourage its application to the radial artery also. Endoscopic radial artery harvesting (ERAH) was associated with better wound appearance, in addition of being safe and effective, with less pain and fewer wound complications than the open surgical technique [3].

As secure skin closure is an important integral step for every surgical procedure, the closure device must provide the strength and the required support for skin tissue, otherwise the wound edges may be gapped or separated, this will provide potential pathway for bacterial contamination, which will lead to infection, as well as suboptimal cosmetic shape, and lower patient satisfaction [4].

Reliable and inexpensive, sutures may take longer time to place, with the additional risk of needle stick injury to the surgeon or the operating staff, in addition to the need for late removal in case of nonabsorbable stitches [5].

Dermabond is a topical skin adhesive that upon contact with a weak base forms a strong polymeric bond across opposed wound edges allowing the normal healing process to occur. It can be used to close easily approximated skin edges of wounds whether they are small surgical incisions or lacerations, with purported advantages over conventional sutures in cosmetic outcomes, cost benefits, and operative times. It provides a protective barrier that adds strength (7-day wound-holding strength in just 3 min) and inhibits bacteria through forming microbial barrier for three days against organisms commonly responsible for surgical site infections. In addition, it affects patient's comfort by providing flexible closure without the pain or anxiety caused by needles as well as fast closure of small incisions and lacerations and eliminating the need for return visits to remove sutures [6].

2. Patients and Methods

An observational study was done at Al Dabbous Cardiac Center, Kuwait, from January 2017 till October 2017. The study enrolled 40 patients divided into two equal groups the Dermabond group and the sutures group. The inclusion criterion was patients who underwent CABG using radial artery which was harvested endoscopically, while open technique for RAH and Negro race are considered as exclusion criteria.

The demographic data were collected, (gender, age, race, body mass index (BMI), preoperative medication and albumin level, as well as diabetes or peripheral vascular disease.

Operatively, 2 cm incision was done medial and proximal to the radial styloid process where radial artery was identified and dissected followed by introduction of the endoscope {VASOVIEW HEMOPRO 2 Endoscopic Vessel Harvesting System}. Using the endoscope, radial artery was completely dissected and cut proximally through 5 mm incision. After its cutting radial artery was pulled to be taken through the initial incision, wound was closed in layers using polyglactin while skin was closed using either Dermabond or polyglactin 3-0 on cutting needle. In the Dermabond group, Dermabond was applied in two layers over the edges of the skin after complete drying. A gap of a few seconds occurred between the applications of the two layers. Dermabond (Fig 1) is highly purified 2-octylcyanoacrylate (OCA) monomer, which, after polymerization is stronger, more flexible and less brittle. A chemical initiator in the applicator tip is used to ensure consistent, reliable polymerization times leading to formulation additives to enhance strength, flexibility, and adherence to the skin [6].

All wounds were closed over suction drain to minimize hematoma formation (Fig. 2). The time of closure was calculated for all patients.

Postoperative variables included incidence of wound complications, cosmetic results, and patient's pain (according to pain scale) and satisfaction including color, size, thickness, pliability, and visibility as well as overall satisfaction (at 6–8 weeks postoperatively) with the scar compared with normal skin (Fig. 3).

Patients were also asked whether the scar was painful or pruritic. The Hollander wound evaluation grading scale was used for postoperative evaluation. Scars were assigned 0 or 1 point each for the presence or absence of the following: width greater than 2 mm, edge elevation or depression, discoloration, suture or staple marks, excessive inflammation and overall poor appearance. A total cosmetic score was then calculated by adding the individual scores on each of the six categories ranging from 0 (worst) to 6 (best) [7].

These data were collected and studied statistically to evaluate any difference between both methods of closure.

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