

A New End Graft Holder for Coronary Artery Bypass Grafting

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This article describes the construction and use of a new end graft holder during coronary artery bypass grafting (CABG). The instrument consists of a pinching device attached to a flexible arm and a fixation clamp. This device provides secure stabilization and enables excellent positioning of the graft without producing graft injury. (Ann Thorac Cardiovasc Surg 2005; 11: 350–1)

Key words: anastomosis, coronary artery bypass grafting, device, graft holder

Introduction

Pickup forceps or various graft holders are commonly used to maintain the position of the graft during coronary artery bypass grafting (CABG).¹⁻³⁾ However, use of these devices has several drawbacks, including graft injury or inadequate grip on the graft. In corporation with Kawanishi Holdings, inc. (Okayama, Japan), we have developed a new end graft holder which does not produce these technical limitations. The goal of this article is to describe the design and use of the novel end graft holder.

Material and Methods

An end graft holder, consisting of a convex, curved shaped clip attached to a flexible arm and a fixation clamp on a sternal retractor, was constructed (Fig. 1). The graft holder was composed of polypropylene, polystyrene and polycarbonate, all of which are recyclable, harmless to the human body, and resistant to ethylene oxide. Two pieces of sponge were fitted inside each of the two blades of the clip for prevention of graft injury. Next, the graft end was

trimmed and then placed between the sponges so that it was indirectly pinched by the clip. The fixation clamp was attached to an arm of a sternal retractor. A small, rectangular plate was connected to the inside of one of the clamp blades using a hinge joint, which enabled firm attachment of the clamp to a retractor of 3 to 12 mm in thickness. Nonskid silicon seats were fitted inside the blades to prevent the holder from slipping off the retractor.

The arm of the holder was multi-jointed and measured 10 mm in diameter. By bending and changing the shape of the arm, the open end of the graft was positioned to the required specification. Anastomosis was then started at the heel using a loose continuous suture technique. After the heel side anastomosis was complete, the graft was released from the holder and positioned by pulling two ends of the suture. The remaining anastomosis was then established in a continuous manner.

Comment

Successful graft placement for CABG is dependent on good visualization and secure stabilization of the graft and target coronary artery. Various graft holders have been designed to facilitate CABG,¹⁻³⁾ but their use is still limited by incomplete stabilization of the graft, inadequate grasping power, graft size mismatch, or graft intimal injury.

The new end graft holder described in the present study is a simple and inexpensive pinching device that uses a

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Received December 27, 2004; accepted for publication April 11, 2005.

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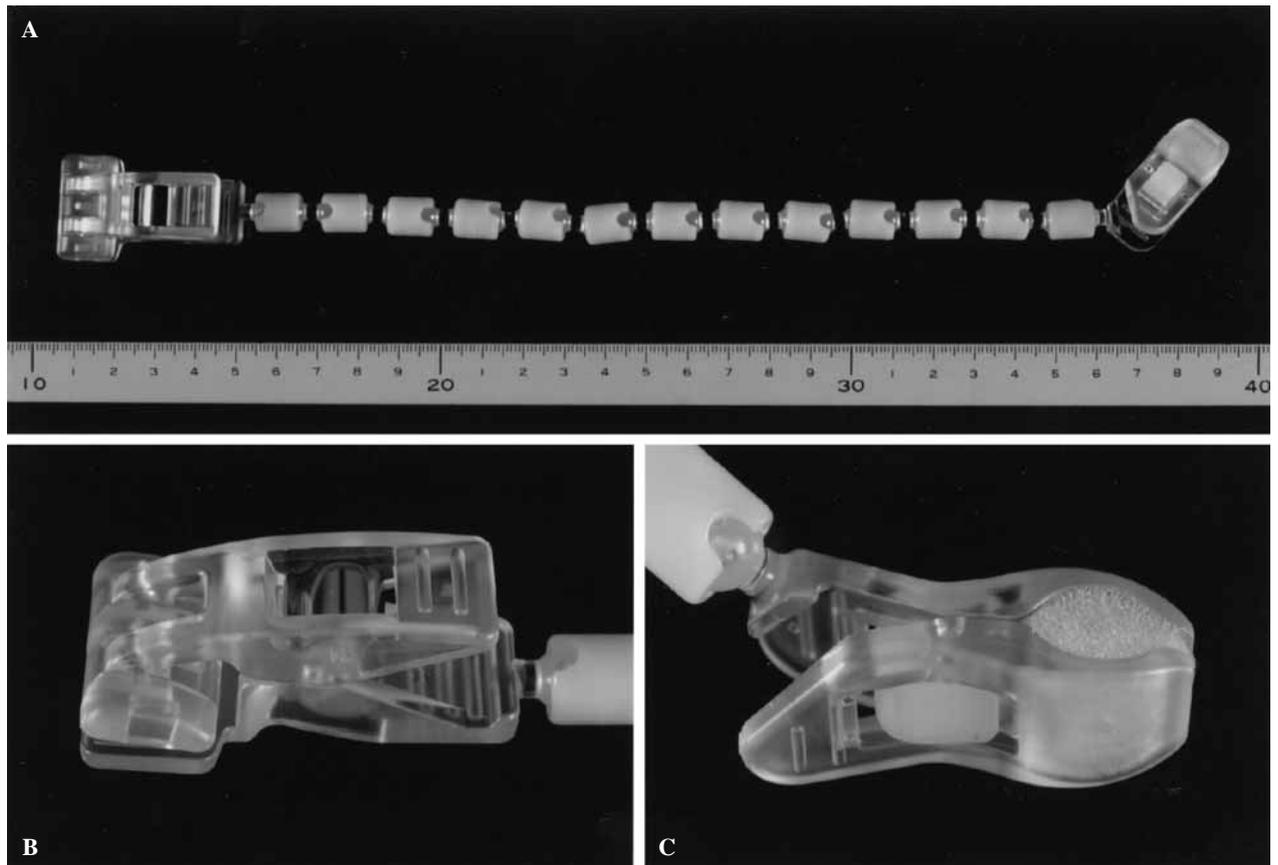


Fig. 1. The new end graft holder.

- A:** Overview.
B: The fixation clamp.
C: The pinching clip.

sponge lining to produce adequate graft fixation without graft injury, regardless of graft size, sort or the amount of the surrounding tissue. The clip is designed for easy attachment and release and can be positioned to any specification by use of the flexible arm. Finally, the graft holder offers an excellent view of the opening of the graft near the target coronary artery, which enables precise stitch placement and minimal handling and anastomosis time. The device reduces the need for surgical assistance from ancillary staff. Furthermore, the device can be employed for proximal anastomosis on the aorta or construction of a composite graft or as a holder of a pencil-type graft holder or a humidified carbon dioxide blower. The initial results with the use of this new end graft holder were

excellent, without incidence of graft injury or anastomosis failure.

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