How-to-do-it

‘Shunt shuffle’ — a simple technique of introducing intracoronary shunts for off-pump coronary artery bypass

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Abstract

Intracoronary shunting is a useful method for maintaining distal perfusion as well as providing a bloodless field during off-pump coronary revascularization. Intracoronary shunts require insertion of both ends through a limited arteriotomy, which sometimes can be troublesome. We describe the ‘shunt shuffle’ as a simple technique, which allows rapid, atraumatic and easy insertion of intracoronary shunts. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

Off-pump coronary artery bypass grafting (OPCAB) is now increasingly reported with good results [1,2]. However, concerns still exist regarding proximal and/or distal snare that occlude the coronary artery in order to achieve a bloodless field that permits the performance of a good anastomosis. Intracoronary shunts have been increasingly used to maintain distal perfusion and allow unhurried construction of anastomoses in a blood-free operative field [3,4]. We describe the ‘shunt shuffle’ as a simple method of shunt introduction into the coronary arteriotomy during OPCAB.

2. Technique

We use any of the commercially available (Clear View, Medtronic USA, Inc.; Axius™ Coronary Shunt, Guidant Cardiac Surgery, USA) intracoronary shunts routinely for OPCAB procedures at the Cardiothoracic Centre, Liverpool. These intracoronary shunts consist of a 20 mm long flexible tube. Both ends of the tube feature a tear drop shaped tip sometimes made from radio opaque material. Tip diameters range from 1.00 to 3.00 mm. A tether with a tab made of radio opaque material is permanently attached to the shunts asymmetrically leaving one end short and the other end long.

We use an Octopus II+ (Medtronic USA, Inc.) stabilizer for performing OPCAB. The target coronary artery is stabilized first. An arteriotomy of adequate size is made. As shown in Fig. 1a the longer end of the shunt is introduced first into the arteriotomy proximally, or distally if the artery has predominantly retrograde flow. The whole shunt is introduced completely inside the arteriotomy with one smooth motion as shown in Fig. 1b. The thread is then grabbed with forceps and pulled distally in the direction of the vessel and with a ring tip forceps simultaneously preventing the distal tip from coming out of the arteriotomy (Fig. 1c), hence ‘shuffling’ the shunt inside the coronary artery. Thus, the shunt is placed in the final position as shown in Fig. 1d. The anastomosis is then constructed using one’s preferred technique while distal perfusion continues through the shunt. The final few sutures in the coronary and conduit are kept loose to remove the shunt. The shunt is removed by ‘reverse shunt shuffle’ thus avoiding any pull on the sutures.

3. Discussion

For the purpose of preventing ischemia in OPCAB, the use of intracoronary shunts has been reported to be effective [3,4]. However, the need to introduce both ends makes it troublesome especially through a limited arteriotomy. The commonly used technique, as described in the user’s manuals, is to bend the shorter end in order to introduce it into the distal artery. Bending the shunt can be troublesome and traumatic and insertion can be difficult especially
through a small arteriotomy. The ‘shunt shuffle’ technique is simple, rapid and atraumatic. It also helps to avoid proximal snaring as the insertion of the shunt with the ‘shuffle’ technique reduces blood flow from the artery. The only disadvantage of this technique is that it cannot be applied if there are calcified plaques near the arteriotomy. Under these circumstances one can bend the shunts to introduce them. We would prefer to use a smaller size shunt with the ‘shuffle’ technique and accept ‘a not so perfect’ bloodless field.

References