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ABSTRACT

Since the advent of off-pump coronary artery bypass surgery, a blower/mister has been routinely used in cardiac operation theatres. In our setup, in an attempt to reduce the cost of coronary artery bypass grafting by performing off-pump coronary artery bypass, reusable materials have been routinely used.

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INTRODUCTION

Initially a commercially available blower/mister supplied by Medtronic (ClearView® Blower/Mister System, Medtronic, Minneapolis, MN, USA) was used for the first few cases. As it was found to be quite expensive, we designed a novel device, which is described herein.

Even when the commercially available blower/mister was in operation, in the majority of cases, the blower alone was used, as the mister was not able to adequately provide a “clear view” as mentioned. The blower in isolation has been used in our facility for the past 3 years, during which time we have also been using oxygen instead of carbon dioxide.

VETTATH'S BLOWER

To fabricate a blower, a coronary osteal perfusion cannula (Medtronic, DLP, Minneapolis, MN, USA), routinely available in the cardiac operating theatre was employed. The tip was discarded and connected to a 20 G IV cannula with half the length trimmed off (Figure 1). The base of the coronary osteal cannula was connected to an IV set with a luer lock and the other end of the IV set (with the chamber removed), was connected to the oxygen outlet via a ¼ inch tubing (Figure 2).

In the majority of cases, a flow of 2–4 litres is maintained and adjusted by the assistant to clear the field. Intermittently the field for coronary anastomosis

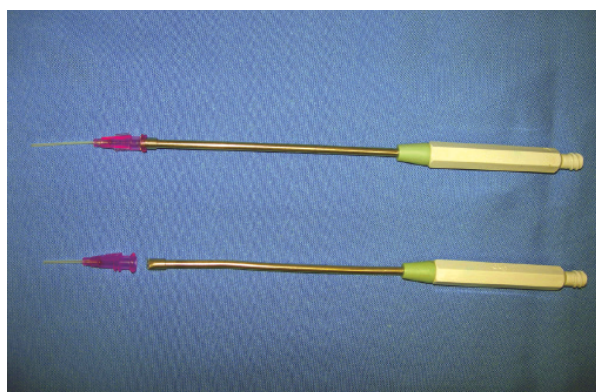


Figure 1. The coronary osteal perfusion cannula with and without the tip.

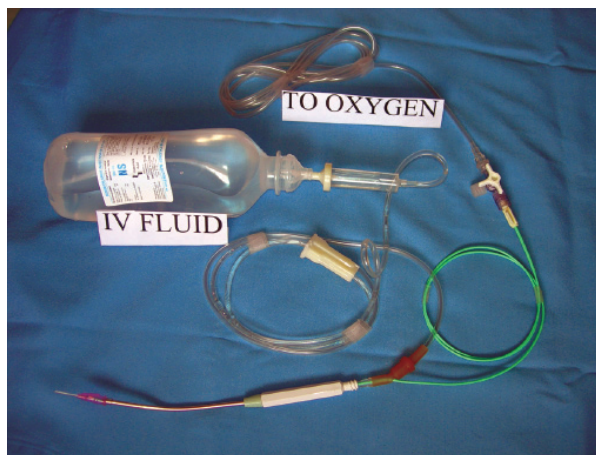


Figure 2. The blower with its connections.

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is flushed with warm saline using a 20 G syringe and vein cannula or a needle butt.

BLOWER — MATERIALS USED

- Coronary osteal perfusion cannula
- IV cannula (20 G)
- IV set, 200 cm with luer lock
- 3-way stop-cock
- ¼ inch tubing
- Oxygen outlet with filter

VETTATH'S BLOWER/MISTER

We have also fabricated a blower/mister utilizing disposable items available in the operating theatre. A coronary osteal perfusion cannula is again the mainstay of the device. An IV cannula is connected to its distal end. To the proximal end, a normal IV set is connected. The other end of the IV set is connected to an oxygen outlet through a ¼ inch tube as in the blower setup.

Another IV set connected to a normal saline bag covered by a pressure bag is used as the fluid outlet. The distal end of the IV set is connected to a Judkins right coronary artery (RCA) catheter (Cordis Corporation, Miami, FL, USA), routinely used for coronary angiography, via a 3-way stop-cock. The end of the Judkins catheter is passed through the rubber section of the IV set (which is connected to the coronary osteal cannula) and into the base of the IV cannula, through the core of the coronary osteal cannula (Figure 3).

The principle of the blower/mister is to blow the oxygen around the fluid that comes from the center of the catheter, thereby delivering a mixture of fluid and air at the end of the IV cannula. This system is able to deliver and provide the same flow as given by the commercially available blower/mister. This could be re-used routinely after ethylene oxide sterilization.

BLOWER/MISTER — MATERIALS USED

- Coronary osteal perfusion cannula
- IV cannula (20 G)
- Two IV sets
- 3-way stop-cock
- ¼ inch tubing
- Oxygen outlet with filter
- Judkins RCA catheter
- Pressure bag with normal saline



Figure 3. The blower/mister with its connections.

CONCLUSION

With the assistance of Vettath's blower and blower/mister, all distal coronary anastomoses have been performed with excellent visibility and precision. In the last 40 months, more than 2,500 coronary anastomoses have been performed in our institute. We have had no episode of gas embolization or scaling of coronaries in our experience. If a blower is used judiciously, with intermittent saline wash, a perfect OPCAB anastomosis is possible with excellent visualization of the anastomotic margins. The blower is used to visualize the aortic rim around the obturator concurrently with Vettath's anastomotic obturator for proximal anastomosis of vein grafts onto the aorta.¹

If used carefully with intracoronary shunts, air embolism can be prevented.² Intracoronary shunts prevent air from accessing the coronary circulation, causing air locks, decreased myocardial contractility and possible life-threatening cardiac arrhythmias.³ The use of a 20 mL syringe coupled to an 18 or 22 G ¼ needle with the tip broken off, as a saline flush, is also an effective device to keep the field clear.⁴

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