<1.80 m², AVD is unlikely to be required, and, therefore, should not be routinely included in the CPB circuit unless required intraoperatively. This rationale would also have cost-saving implications.

Our study also suffers a number of limitations. First, despite all data being prospectively recorded, it has been analysed retrospectively. Second, the patients were not randomised into either of the two groups. Third, the decision to use AVD was purely at the discretion of the surgeon and the clinical perfusionist, based on their assessment of the venous drainage, and thus a selection bias could exist. Finally, it is a relatively small study.

Despite these limitations, we have observed that AVD is not essential in every patient who undergoes mAVR, and is more likely to be used in patients with a larger BSA.

References


eComment: Rationalizing the use of assisted venous drainage during minimally invasive valve surgery

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During minimally invasive valve surgery, a good exposure with a bloodless field is a prerequisite for the ease and success of the surgery. We would like to comment on the issue regarding the use of assisted venous drainage (AVD) raised by the authors [1]:

AVD is an important tool available for cardiac surgeons to achieve a bloodless operating field and to empty the heart in order to perform the most important part of the valve surgery. Using direct cannulation of the right atrium might cause crowding of the operative field due to the presence of aortic, venous and venting cannulas as well as aortic-clamp and CO2 line supply passing through the incision site. Additionally, due to the higher position of the venous cannula in the right atrium, it might need more negative pressure for AVD. Instead, cannulating the femoral vein with double-staged venous cannula (the Remote Access Perfusion Femoral Venous™ cannula, RAP FV; Estech Inc, USA) or multi-stage cannula (Bio-Medics® Multi-Stage Venous Cannula, Medtronic Inc, USA) eliminates such discomforts and permits good venous drainage using minimal AVD of –30 to –50 mmHg.

In our practice, we prefer femoral vein cannulation almost in every minimally invasive valve surgery and we try not to exceed the AVD more than –70 mmHg, which helps to reduce the risk of cavitations, hemolysis and trapping of the vein walls around the cannula holes [2]. Moreover, using venous cannula through the femoral approach allows the surgeon to manipulate the cannula according to the needs (toward, downward or upward) and to twist it easily without changing the plan of the operation. These manoeuvres could help to avoid inadequate blood volume or excessive siphon pressure, which might cause compliant venous or atrial walls to collapse against cannular holes to produce ‘chattering’ or ‘fluttering’.

According to Murzi et al. [3], the RAP FY cannula provides a constant and safe venous drainage from the inferior and the superior part of the body and assures an adequate systemic perfusion during cardiopulmonary bypass (CPB). We think that, if peripheral cannulation is used to establish CPB, it allows better exposure and adequate venous drainage with minimal AVD.

Furthermore, as reported by Vaughan et al. [1], they have not observed any hemolysis or embolism in their series. So, use of AVD should be rationalized, but should not be restricted.

References


eComment: Is there a need for the assisted venous drainage in the minimal invasive valve surgery

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We read with interest the comments by Tiwari et al. [1]. We agree in general with the authors that the success of the surgical procedure is depending on clear exposure of the operative field. This seems to be essential when performing a minimal invasive cardiac surgery. However, many roads lead to Rome, and this is also true to achieve a successful venous drainage during cardiopulmonary bypass (CPB). The dilemma should be: is it successful and effective enough, and is it really the best that we
can give to our patients? At this point of the discussion we have to mention that in general nowadays we have two options for minimal invasive femoral cannulation: 1) the standard remote cannulation and 2) the cannulation with the self-expandable device (Smartcanula LLC, Lausanne, Switzerland).

It is true that the flow, when using the standard remote cannulation, may be achieved by using either a centrifugal pump or vacuum assistance. However, there are anatomical, physiological and physical limits, which may influence the safety of the patients.

On the other hand, the self-expanding device approved in clinical as well as in experimental set-up results in a superior drainage compared to nowadays commercially available minimal invasive remote venous cannulas.

It seems that the most important advantage is in the different morphology of these two different devices. Namely the SmartCannula mimics the natural stiffness of the venous wall of the venous sinuses in the skull. Implanting the self-expanding device into the vein, this entirely fits the natural shape of the vessel; additionally with its relatively stiff mesh structure it provides the target vein a new internal wall support. In this way, it prevents the collapse of the vein in case of a negative flow pressure and it ensures the flow toward the reservoir even in the negative driving pressure.

References


