Who really needs an “elephant trunk”?

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See related article on pages 416-22.

In their article in the present issue of the *Journal*, Castrovinci and colleagues¹ report on their broad experience of “elephant trunk” procedures performed over a long period of time. This set of results is probably one of the largest published so far in this subject area. The results obtained can be considered quite good, as the overall mortality was 8% after the first procedure, and 7% in patients undergoing a second procedure. This article confirms results published in a previous paper by the same group,² in 2002, that reported similar excellent results. In addition, it confirms other recently published studies³⁻⁵ of thoracic aortic replacements using this technique that have generally reported satisfactory results even when both first- and second-stage operations were included.

Nevertheless, all those articles leave the reader somewhat disappointed. One question lies behind all the results and statistics reported in those papers, which is seldom addressed and never answered: Who really needs an elephant trunk procedure?

After Hans Borst and colleagues⁶ had described this astute and efficacious technique, which was later modified by Svensson,⁷ it soon appeared that it had the advantage of making the second operation much easier. As a matter of fact, with the elephant trunk, surgeons discovered that the dissection of the distal arch and proximal descending aorta was either not necessary or quite limited, and that the possible difficult suture of the distal prosthesis was in most cases changed into a simple prosthesis-to-prosthesis anastomosis. The technique was then considered to be a major breakthrough; its indications rapidly increased, and it became widely used.

Yet, with increasing use, some complications and issues arose.⁸ But the most important issues were not technical; they consisted of 2 main features: (1) the reduced but undeniable mortality observed between the 2 stages of surgery; and (2) the fact that a large number of patients do not undergo the second stage; the proportion of such patients has been

reported to be around 40% to 50%.^{1,2,4,5} Why is it so? The reasons might be linked to the success of the procedure.

The elephant trunk technique is performed in 2 kinds of patients. On the one hand are those with an obvious and unquestionable need for an extended aortic replacement (ie, with a largely dilated descending or thoracoabdominal aorta or a dilated residual chronic dissection after repair of a type A acute dissection, especially in Marfan patients, etc). Most of those patients undergo the second-stage operation. But even in this group, some do not, for various reasons: they die before the second stage is decided or planned; they refuse to undergo another physically and psychologically painful and stressful procedure; they escape the indispensable surveillance and follow-up, and so on. However, the problem of those patients has lost its acuity in the past decade because many of them can presently be treated in a single-stage procedure by using the frozen elephant trunk technique.

On the other hand are those patients in whom the elephant trunk is performed according to the surgeon's preference, in view of a possible future procedure but with no pressing indication, as doing an elephant trunk during a total replacement of the transverse aortic arch is quite easy in most cases. Many of these patients never undergo the second-stage operation. Consequently, an obvious and inevitable question arises: When, and in which patients, should the second-stage procedure be carried out?

In this regard, the present report could have been more informative. In patients who underwent the second-stage procedure, the median interval between the 2 stages was 6 months (range, 1-111 months). This seems rather long. Eight patients died during the “waiting” time. The authors, unfortunately, do not provide any explanation, and although they state that the second stage should be performed as soon as possible, they have not analyzed the reasons for those long delays.

But, more importantly, a comprehensive analysis of the evolution of the patients in whom the elephant trunk was performed only in view of a possible future evolution would have been of major interest. Key questions include the following:

- In how many patients did the distal aorta really evolve toward a large aneurism?
- In how many patients were sudden emergent complications observed?
- What was the rate of increase (if any) of the distal aorta diameter?
- What was the rate of reoperation in this group as compared with the rate for those who already had an aneurismal distal aorta?

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- What were the number and outcomes of reoperations for dissections compared with aneurisms?
- What about the Marfan patients?
- What type of surveillance should be used for patients in whom the elephant trunk was not mandatory?

By answering those key questions, the authors, with their extensive experience, could have brought some important information to the surgical community and possibly changed our daily practice somewhat. Unfortunately, it seems that our question—Who really needs an elephant trunk?—remains unanswered.

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