An instrument facilitates mitral valve repair training at home

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Abstract

The importance of surgical simulation has grown in the quickly changing climate of modern surgical training. Prior to operating on human hearts, practice in appropriate experimental models is necessary to attain adequate experience. Nowadays, training of surgery residents has shifted to simulation workshops and residency programmes outside the operating theatre. We have experience in training our residents to perform mitral valve repair techniques in bovine hearts. Previously, the heart would be fixed on the tablecloth with simple stitches, which proved to be a complex and difficult technique while performing surgery. Moving forwards, we have built a successful ‘surgical table’ to achieve better stabilization and to simplify the surgery. This paper describes our model, which could be a helpful tool for any cardiac surgeon performing surgical techniques successfully at home.

Keywords: Surgical table • Mitral valve repair • Bovine heart model • Surgical techniques

INTRODUCTION

In recent years, simulation in surgery has been discussed by many educators. A bovine or porcine model of cardiac surgical simulation can be performed in surgical laboratories. However, in our study model, a surgical table was designed to give the opportunity to surgery residents to learn by oneself at home. With this table, mitral, aortic and tricuspid repair or coronary anastomotic techniques can be studied and experimented at home alone. It is a cheap tool, and the presence of a second person for assistance is not necessary. It can be used in hospitals to train cardiac surgical residents who do not have surgical laboratories.

TECHNIQUE

Two chromium steel rods were fixed on to two corners of a tea tray (30 × 40 × 2 cm), and two left atrial retractors were mounted on each rod, capable of three-dimensional movements. A smaller table was fixed obliquely in the centre of the surgical table to hold the bovine heart (Fig. 1a).

The heart set-up begins by assessing the heart for non-anatomic defects from the butchering process. With this table, mitral, aortic and tricuspid repair or coronary anastomotic techniques can be studied and experimented at home alone. It is a cheap tool, and the presence of a second person for assistance is not necessary. It can be used in hospitals to train cardiac surgical residents who do not have surgical laboratories.

stabilization (Fig. 1b). The Mitral valve apparatus was examined by starting from the P1 scallop with nerve hooks in order to assess any chordal rupture or elongation (Fig. 1c). If there were no leaks in the valve, a lesion (chordal cut, resection or perforation of the leaflets) was created in the mitral apparatus and then the valve was examined again to select the most suitable repair technique.

After repair, the left ventricle was filled with water to perform a saline leakage test (Fig. 2a–c).

COMMENT

Valve repair offers a distinct event-free survival advantage compared with replacement with a bioprosthetic or mechanical valve [1–3]. Despite a consensus in guidelines encouraging mitral valve repair [4], it is interesting to note that a significant number of patients with degenerative mitral-valve disease still undergo planned mitral valve replacement all over the world, including in the USA [5]. This results in many patients receiving a valve replacement, not because the valves are irreparable, but because they are operated on by surgeons who do not have the specific expertise required to complete a successful repair [5].

In surgical education, a desire to move basic skills-acquisition out of the operating theatre still exists [6]. Therefore, to increase the experience in heart surgery, performing on porcine or bovine heart models is essential.

Our cardiac surgical table was designed to accomplish valve surgery (mitral valve repair, aortic valve sparing procedures, tricuspid valve repair etc.). Not only surgical residents, but also staff members and cardiac surgeons who wish to make training in complex surgical techniques such as mitral or aortic valve repair without any assistance, can use this surgical table.

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REFERENCES