

Edwards Sapien Transcatheter Valve

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Abstract— The Edwards Sapien transcatheter valve revolutionizes the field of cardiology. This valve corresponds to a procedure that takes negates the need for open heart surgery, lessening recovery time and risks associated with open heart surgery.

I. INTRODUCTION

Artificial valves were first used in the year 1952 by Charles Hufnagel with his invention of the mechanical caged ball valve [6]. Artificial valves have been improved upon over the years, with numerous advances in both mechanical and tissue valves being made. Until recently, the only method for implanting these valves was to perform open heart surgery. However, the Edwards Sapien transcatheter valve uses a catheter as part of a minimally invasive procedure, which could be a much safer procedure than open heart surgery. Also, this could increase the use of tissue valves, which allow for a better quality of life for the patient due to the lesser degree of blood thinners required.

II. METHODS

The Edwards Sapien, produced by Edwards Lifesciences, LLC, offers a minimally invasive procedural alternative to open heart surgery [5]. By placing the valve on the end of a specialized catheter tube, doctors insert the catheter through the femoral artery and up to the heart using a catheter and echocardiographics for guidance. A balloon is then expanded, placing the valve in the correct position [3]. This procedure is mainly used for the aortic valve right now, as this is the easiest valve to get to.

III. RESULTS

The results of this procedure have been promising so far. The valves function normally once in place. The patients do need to follow a blood thinning regimen, so that the blood may flow more easily through the valve. Unfortunately, the long term effects of this procedure are not known because this procedure is still relatively new [2]. For reference, the FDA did not approve the procedure until November 2, 2011. It was performed in Europe prior to this, but not for a significant amount of time. One result of this procedure that is apparent already is that patients who underwent this procedure are three times more likely to have a stroke than those who underwent the open heart procedure, and the exact reason is unknown [2]. The latest version, the Sapien XT, is shown to cause slightly less strokes [4].

IV. DISCUSSION

This procedure can completely change the way that heart valves are replaced. First and foremost, the procedure has the potential to be much safer and less risky for the patient. Open heart surgery risks infection and other complications, whereas a transcatheter operation minimizes this. Secondly, this procedure greatly decreases recovery time. This procedure would still require significant recovery time, but a catheter procedure would require significantly less than an open heart procedure.

Obviously, there are some improvements that need to be made. The issue of the strokes needs to be addressed, because otherwise the procedure will only be performed on older patients. Also, the durability of the tissue valves could be improved, as they only last 10-15 years on average. Polyhedral Oligomeric Silsesquioxane, the chemical that engineers are trying to develop, is promising in regards to deterring calcium buildup, which would lengthen the lifespan of the valve [1]. If improvements are made, tissue valves could potentially replace mechanical heart valves, making the quality of life for those with artificial valves much more desirable.

REFERENCES

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