INCIDENCE OF ARRHYTHMIAS IN THE TRANSVERSE TRANSSEPTAL APPROACH FOR THE MITRAL VALVE PROCEDURES

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INTRODUCTION

The opinion is firm that cardiac surgery began on September 10, 1896, when Ludwig Rehn sutured successfully a myocardial laceration. Actually, as early as 1810 operative drainage of the pericardium was performed by a little Spanish Surgeon Francisco Romero, and the highly regarded Baron Larrey. ***(Shumacker, H.B. Jr., 1987)***

As early as 1898, Shamways suggested the possibility of opening a stenotic Mitral Valve by digital splitting of the fused commisssures. Souttar in 1925, reported the first successfully closed Mitral Commissurotomy, surprisingly he didn't attempt to repeat it. It was only 20 years later that Harken and colleagues restarted the digital dilatation of the stenotic valve through the left atrial appendage. ***(Duran CG, 1989)***

During the late 1950's and especially during the 1960's the availability of a safe technique of cardiopulmonary Bypass made the visualization of the heart valves possible. The description by Carpentier and his colleagues of the concept of selective annulus remodeling by means of a prosthetic ring can be considered the origin of the reconstructive surgery of the atrioventricular valves. ***(Carpentier A, et al., 1971)***

In the study by Rizzoli and his colleagues, they stated that mechanical valvular prosthesis have the advantage of longetivity, although there is still a low incidence of reoperation. ***(Rizzoli G, et al, 1999)*** Planning the best approach to the mitral valve is an important part of any reoperation, however small left atrium, any adhesions between the heart, the lung, the mediastinum, and the sternum. These adhesions may cause severe or catastrophic bleeding at reentry. ***(Stark J,and Pacifico AD.1989)***

Operation on the Mitral valve requires excellent exposure. Mitral valve visibility is impaired by the posterior location of the left atrium held by both venae cavae. The difficulty is especially significant in the presence of a small left atrium, this has given rise to a variety of surgical approaches. One of these approaches is the transseptal approach. ***(Kumar N, et al., 1995)***

Optimal mitral valve repair or replacement requires an excellent exposure. The transseptal approach proved to offer an excellent exposure with less inherent complication, especially in case of redo operation, concomitant Tricusped valve intervention, small left atrium, and in case of Mitral valve repair. The transseptal approach is also a very safe and reproducible technique for use in patients with friable tissues, and heavily calcified Mitral valves. ***(El Saegh MM, et al., 1993)***

Utley and his colleagues compared the outcome of the atrial, the Superior and the transverse transseptal approach to the mitral valve. They found that in patients with Sinus Rhythm before the operation, 80% of the cases subjected to left atriotomy approach, 69% of the patients subjected to transseptal approach, 46% of the cases operated upon through the Superior Septal approach maintained the sinus rhythm on discharge. ***(Utley JR, et al., 1995)***

AIM OF THE WORK

Through this thesis we are trying to know Incidence of Arrhythmias in the Transverse Transseptal Approach for the Mitral Valve Procedures.

REVIEW OF LITERATURE

HISTORICAL BACKGROUND

Significant progress has been achieved in cardiac surgery in the last 50 years. Mitral Valve surgery (especially for the relief of mitral stenosis) has paralleled the innovations and trends of cardiac surgery and often has served as the benchmark of the latest procedures, and techniques. A chronological survey of mitral valve surgery is presented, with emphasis on parallels to cardiac surgery in general and with highlights of key figures, and events that have conclusively altered the surgeon's approach to succeed, with cardiac dysfunction. A few surgeons promulgated the idea of cardiac surgery in the late 19th century, but mitral valve surgeries were not performed in earnest until Souttar's and Cutler's initial attempts in the 1920s and were not successful on large groups of patients until Bailey and Harken made independent breakthroughs in the 1940s. ***(Mohammed Nasir Khan, 1996)***

Considerable amounts of experimental investigation during these years and after World War II in 1948 finally resulted in the widespread use of closed mitral commissurotomy, a successful therapy for noncalcified mitral stenosis. ***(Cohn LH, Soltesz Eg, 2003)***

Before venturing further into the history of mitral valves, we must take a brief detour through the advances in open-heart surgery, as these techniques were critical to the advances of mitral valve surgery.

It is difficult to single out 1 person or group of people who were responsible for the great strides in open-heart surgery, and even when a person is chosen, his work often is like the apex of a man-made mountain, an accumulation of research, experimentation, and previously failed attempts by him and many others before him.

John Gibbon performed the 1st successful open-heart operation on a human patient using a heart-lung machine on 6 May 1953. ***(Aciemo LJ, 1994)***

The road to this triumph was fraught with setbacks, delays, and technical difficulties, yet Gibbon, through his determination, was able to pursue his dream to its end. He describes his 1st success as an "event that I hardly dreamed of in 1931," the year he was 1st inspired by the idea of extracorporeal circulation when he helplessly monitored the deteriorating condition of a woman with pulmonary embolus. ***(Gibbon JH Jr, 1978)***

One of the immediate benefits of cardiopulmonary bypass was the possibility of operating directly upon damaged mitral

valves. At the outset, the strategy continued to be that of repair, but with a clear view and adequate time. Lillehei is credited with successfully completing the 1st surgical correction of mitral valve insufficiency in 1956. ***(Aciemo LJ, 1994)***

Complete replacement with a mechanical valve initially fared no better than partial replacement. The 1st reported mitral valve replacement took place on 22 July 1955 in England, with Judson Chesterman performing the surgery. ***(Norman AF., 1991)***

Coincidentally; Chesterman used a valve that closely resembled the Starr-Edwards valve in design.

An effective approach to surgery of the Mitral valve began with Harken and Bailey in USA, and Brock in England. During this time the approach to the Mitral valve through the left atrium becomes established. ***(Cooley, 1996)***

The increasing variety and complexity of mitral valve operations led to the invention of alternative approaches to the mitral annulus. The traditional vertical atriotomy just posterior to the interatrial groove affords good exposure of the mitral annulus when the left atrium is enlarged. ***(Hartz RS, Kanady KE, LoCicero J III, Sanders JH Jr, DePinto DJ, 1991)***

Early in the development of cardiac surgery, Julian and his colleagues described transseptal exposure of the mitral valve. Other authors advocated various technical modifications. Dubost transverse transseptal, the superior approach (dome incision of the left atrium) also provides good exposure of the mitral annulus.

In Summary, the treatment of Mitral valve disease has advanced far beyond its early beginnings. There has been constant progress towards improvement of the valvular prosthesis and techniques of repair. ***(Cooley, 1996)***

RELATED SURGICAL ANATOMY

Anatomy of the SA node:

The sinoatrial (SA) node is a section of nodal tissue that is located in the upper wall of the right atrium. The SA node is also referred to as the pacemaker of the heart.

The sinus node is located at the junction of the right atrium at the crista terminalis, in a grove called sulcus terminalis a thick band of atrial muscle at the border of the atrial appendage, and the superior vena cava. The sinus node is located beneath the epicardial surface of the crista terminalis; there is a layer of atrial muscle between the node and the endocardium so that it does not occupy the entire thickness of the atrial myocardium. (Fig.1)

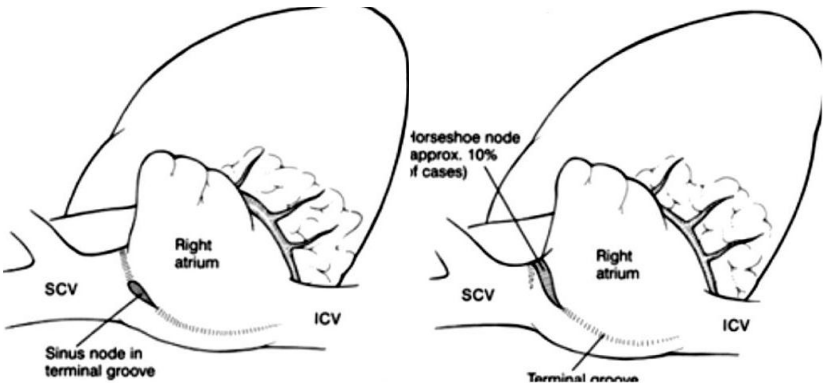

Fig. (1): This Diagram Shows the location of the Sinus Node at the Superior Cavoatrial junction. The node usually lies to the right side of the junction but may be draped in Horse Shoe fashion across the anterior aspect of the junction ***(Mill et al. 1997)***.