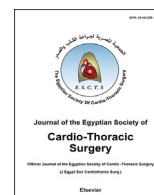


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# Surgical isolation of the left atrial appendage: A new technique

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## ABSTRACT

Atrial fibrillation (AF) is a dismal arrhythmia. Thirty to forty percent of patients with mitral valve diseases have chronic AF at the time of surgery with increased incidence of morbidity and mortality postoperatively. Thromboembolism is well known among patients with AF despite adequate anticoagulation therapy and the left atrial appendage (LAA) has been proposed to be its main source. In 2014 LAA has been considered for surgical closure in the AF treatment guidelines. Several surgical techniques have been adopted to exclude LAA during surgery and none of them proved to be completely effective. The main goal of our described new technique is to completely separate the LAA from general circulation avoiding failures of other techniques.

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## 1. Introduction

It has been confirmed that; the main source of the intracardiac thromboembolism is the left atrium and more specifically the LAA [1]. Current guidelines suggest obliteration of the LAA during mitral valve surgery [2]. The surgical Maze procedure for AF originally adopted by Cox also incorporates excision of the LAA [3]. Recently, the LAAOS (Left Atrial Appendage Occlusion Study) stated that LAA occlusion by any one of described techniques during coronary artery bypass grafting is safe and can be done without affection of operative time or increasing postoperative bleeding incidence [4].

Excision and exclusion have been described as popular surgical techniques to occlude or isolate LAA during open heart surgery. Although simple to perform; many authors have questioned their effectiveness [5,6].

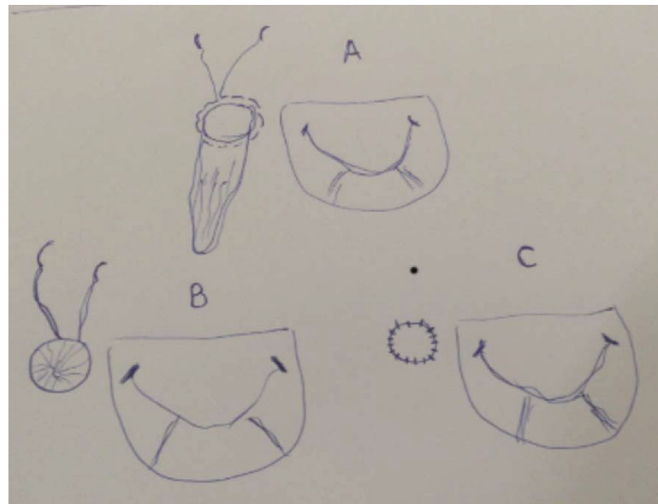
## 2. Technique

Under complete general anesthesia and through midline sternotomy the full cardiopulmonary bypass (CPB) instituted by routine cannulation of the ascending aorta for infusion and bi-venous cannulation for venous return. Myocardial protection achieved through intermittent, antegrade, warm blood hyperkalemic arrest and mild systemic hypothermia (32–34 °C).

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**Fig. 1.** Shows diagrammatic representation of the operative technique. A: Inverted LAA with purse string suture around its base. B: LAA mouth After tying down the purse string suture. C: Pericardial patch completely cover the LAA mouth.

Routine Transesophageal Echocardiography (TEE) was done prior to commencing CPB to confirm the diagnosis of the primary pathology, evaluate the LV function, evaluate other cardiac structures and exclude the presence of LAA or left atrial (LA) thrombi.

The LA cavity was approached through the trans-septal bi-atrial incision as that approach facilitates surgical manipulations of LAA, especially with small LA. The LAA was carefully inspected for the presence of minute thrombi not detected during the TEE examination.

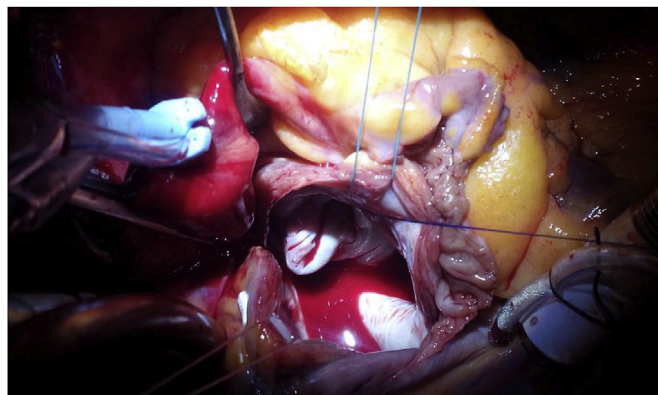
The LAA was gently inverted inside the LA cavity with the aid of gentle external digital pressure and carefully inspected for the presence of minute thrombi hidden in the trabeculae of the pectinate muscle (Fig. 1).

A 4/0 polypropylene suture was used to make purse string exactly at the junction of the LAA with the LA (LAA base) and ensure not to take deep bites to avoid injury of circumflex coronary artery then the LAA was reverted to its normal position and the purse string was tied down to close the LAA mouth and reduce its base circumference (Fig. 2).

A piece of the fresh pericardium was harvested and sutured with 5/0 polypropylene suture continuously covering the occluded LAA mouth. Care was taken not to take deep bites and completely cover the LAA base especially the corrugated borders due to the effect of the tied purse string (Fig. 3).

Ten (10) centiliters of a heparinized blood was injected into the LAA cavity using a fine needle through its body and gentle milking was done to elevate the pressure inside mimicking its contractions to discover any residual leak and if any additional stitch was used to control it.

It's important to deal with the appendage before completing the valve repair or replacement for better visualization and manipulation.



**Fig. 2.** Operative view shows trans septal biatrial approach and inverted LAA inside LV cavity with purse string suture at its base.

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