

# Left atrial appendage occlusion

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## Abstract

### Background

One of the most important heart diseases is mitral stenosis (MS) that can due to left atrial and left atrial appendage clot. Blood clots in the left atrial appendage (LAA) can result in emboli, which can cause ischemia damage to the brain, kidneys, or other organs.

### Objective

To determine the left atrial appendage occlusion

### Methods

A cross-sectional study was conducted at a Global Medical Complex, Afghanistan, which was performed between September 2021 to July 2023, The total number of patients in our study were 100. The number of Male patients were 63 and female were 37. For all patients, we did diagnostic tests, BMI. We also took parameters of Diabetes , hypertension and coronary heart disease. We excluded pregnant women and children in our study. Data was tabulated and analyzed by SPSS version 25.

### Result

In a current study total 100 patients were enrolled. The minimum age of patients were 61 years and the maximum age of the patients were 82 years. The mean age were  $71.94 \pm 5.726$  years.

The minimum BMI of patients were 23 (Kg/m<sup>2</sup>) and the maximum BMI were 35 (Kg/m<sup>2</sup>) . The mean BMI were  $28.55 \pm 3.740$  (Kg/m<sup>2</sup>). The minimum Diameter of the Appendage of patients were 17 (mm) and the maximum Diameter of the Appendage were 34 (mm). The mean Diameter of Appendage were  $25.94 \pm 5.705$  (mm). P-values were  $< 0.05$ .

The frequency of type of appendage chicken wing were 24 and its percentage were 24%. The frequency of type of appendage cauliflower were 46 and its percentage were 46%. The frequency of type of appendage wingsockg were 30 and its percentage were 30%.The frequency of diagnostic test trans-oesophageal echocardiology (TEE) were 93 and its percentage were 93%. The frequency of diagnostic test Cardiac CT were 7 and its percentage were 7%.

The frequency of chest pain were present in 98 patients and its percentage were 98% and the frequency of chest pain were not present in 2 patients and its percentage were 2%.

## Conclusion

We concluded that left arterial appendage occlusion (LAAO) is the best strategy for stroke reduction in old age people. The left arterial appendage occlusion (LAAO) procedure is more beneficial as compared to open surgery. Patients who have left arterial appendage have chest pain and hypertension. This type of disease is more common in old age people. In our study males were more as compared to females.

**Keywords:** Left arterial appendage occlusion (LAAO), left arterial appendage (LAA), Arterial fibrillation (AF).

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## Introduction

One of the most important heart diseases is mitral stenosis (MS) that can due to left atrial and left atrial appendage clot. Blood clots in the left atrial appendage (LAA) can result in emboli, which can cause ischemia damage to the brain, kidneys, or other organs supplied by the systemic circulation in 90% of cases of atrial fibrillation. One therapy approach to stop blood clots from forming in the left atrium is left atrial appendage occlusion.[1] Treatment for left atrial appendage occlusion aims to stop blood clots from forming in the left atrium. The most prevalent cardiac arrhythmia that is clinically significant is atrial fibrillation (AF). The prevalence rises with age and is believed to be between 1% and 2% in the general population. Atrial fibrillation (AF), which has been linked to 15%–20% of all ischemic strokes, is strongly associated with stroke.[2,3,4] Stroke events are five times more common in patients with AF, and they also have higher rates of death, morbidity, and recurrence. There is variability in the temporal association between atrial fibrillation (AF) and stroke; some patients have AF at the time of stroke.[5] The LAA is a protrusion that resembles a finger that is next to the left atrium's (LA) main body. Most people consider it to be a skeletal trace of the original LA.[6] The procedure used a percutaneous transcatheter transseptal technique to remove LAA from the bloodstream. Furthermore, LAA blockage during coronary artery bypass grafting (CABG) was demonstrated by Healy et al. to be safe and effective in preventing stroke.[8] For patients unable to take oral anticoagulants due to recent or past bleeding, pregnancy, or other conditions, LAA occlusion may be an option.[9] This is especially true for the elderly, yet research suggests that anticoagulants may also be beneficial for them.[10] Despite LAA blockage, catheter-based methods were typically used.[11] During heart surgery, the left atrial appendix (LAA) can be readily removed, sutured, stapled, or ligated to remove it from the systemic circulation because it is the most prevalent site of thrombus formation in patients with atrial fibrillation (AF) and mitral stenosis (MS). The effectiveness of routine LAA occlusion in patients undergoing elective coronary artery bypass graft surgery is being assessed by the ongoing LAA occlusion study (LAAOS). The percutaneous LAA trans-catheter occlusion (PLAATO; Appriva Medical Inc.) and the WATCHMAN LAA system are two recently released devices that are specifically made for this purpose.[12] Trans-esophageal echocardiography (TEE) is currently used for every patient suspected of having a LAA clot because it is one of the best methods for identifying thrombus in LAA.[13] A TEE must be done prior to surgery in order to assess the degree of closure and the existence of blood clots. Nevertheless, AF sufferers lack this function, which significantly reduces their ability to empty their appendages. Virchow's triad—increased atrial fibrosis and dilatation typical of atrial fibrillation, enhanced blood coagulation, and stasis—underlies thrombus formation in atrial fibrillation. By removing or blocking the LAA, the appendage is kept out of the bloodstream, which inhibits the production of thrombi and, ultimately, embolization.[15,16, 14] OAC medication lowers the risk of stroke in people with AF and is advised for stroke prevention in AF patients who have risk factors.[17] A common description of the left atrial appendage is a little, ear-shaped protrusion of the left atrium's muscular wall. It is located anteriorly in the atrioventricular sulcus, adjacent to the pulmonary veins, phrenic nerve, and left circumflex artery.[18,19] The appendage has a capacity of around 9 mL and is 46 mm long.[20] It is commonly known that in individuals with nonvalvular AF, the LAA serves as the main location for thrombi to develop.[21]

## MATERIALS AND METHODS

A cross-sectional study was conducted at a Global Medical Complex, Afghanistan, which was performed between September 2021 to July 2023, The total number of patients in our study were 100. The number of Male patients were 63 and female were 37. For all patients, we did diagnostic tests, BMI. We also took parameters of Diabetes , hypertension and coronary heart disease. We excluded pregnant women and children in our study. Data was tabulated and analyzed by SPSS version 25.

## Results

**Table 1:** Mean age, BMI and diameter of appendage of all the enrolled patients ( $n=100$ )

Variables	Minimum	Maximum	Mean $\pm$ SD
Age (Years)	61	82	71.94 $\pm$ 5.726
BMI (Kg/m <sup>2</sup> )	23	35	28.55 $\pm$ 3.740
Diameter of Appendage (mm)	17	34	25.94 $\pm$ 5.705

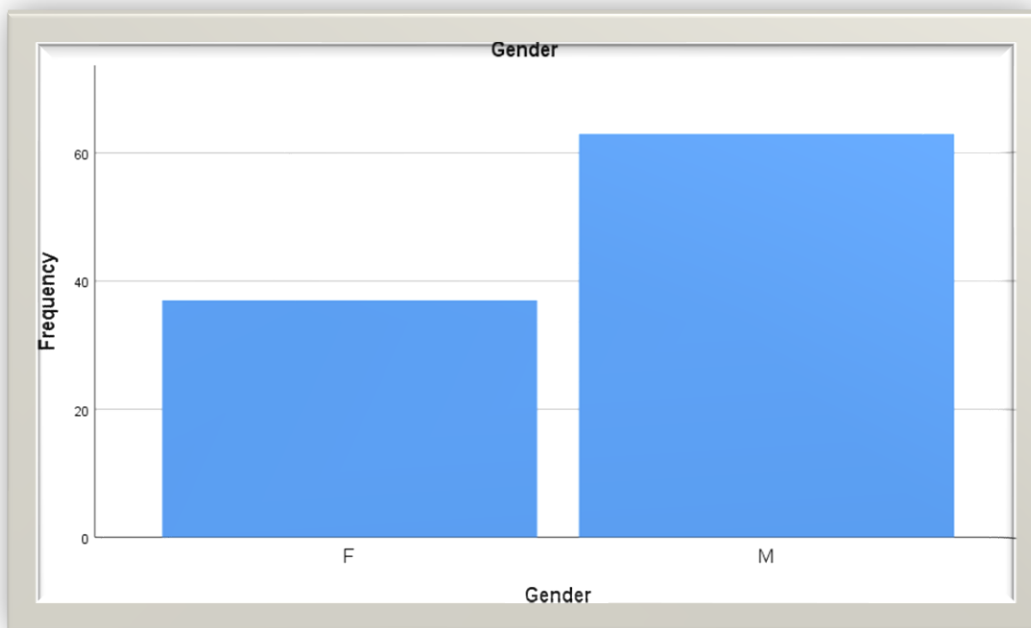
In a current study total 100 patients were enrolled. The minimum age of patients were 61 years and the maximum age of the patients were 82 years. The mean age were 71.94 $\pm$ 5.726years.

The minimum BMI of patients were 23 (Kg/m<sup>2</sup>) and the maximum BMI were 35 (Kg/m<sup>2</sup>) . The mean BMI were 28.55 $\pm$ 3.740 (Kg/m<sup>2</sup>). The minimum Diameter of the Appendage of patients were 17 (mm) and the maximum Diameter of the Appendage were 34 (mm). The mean Diameter of Appendage were 25.94 $\pm$ 5.705 (mm).

**Table 2:** Frequency and Percentage of Gender ( $n=100$ )

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
F	37	37.0	37.0	37.0
M	63	63.0	63.0	100.0
Total	100	100.0	100.0	

In the above table 2, the frequency of Female patients were 37 and the percentage were 37. The cumulative percent were same 37. The frequency of male patients were 63 and the percentage were 63. Total number of patients were 100 (100 %) in our study.



**Figure 1:** Bar chart of gender distribution.

In Figure 1, we did a gender distribution, we can see the male and female patient percentages in the above bar chart.

**Table 3:** Characteristics of enrolled patients (n=100)

<b>Variables</b>		
<b>Chest Pain</b>	Frequency	Percentage
NO	2	2.0
YES	98	98.0
<b>Hypertension</b>		
NO	19	19.0
YES	81	81.0
<b>Diabetes</b>		
NO	58	58.0
YES	42	42.0
<b>Coronary artery disease</b>		
NO	70	70.0
YES	30	30.0
<b>Heart Failure</b>		
NO	75	75.0
YES	25	25.0

<b>Device used</b>		
Amplatzer	14	14.0
Watchman	86	86.0
<b>Type of Appendage</b>		
Chicken wing	24	24.0
Cauliflower	46	46.0
Windsock	30	30.0
<b>Diagnostic Test</b>		
Cardiac CT	7	7.0
Trans-oesophageal echocardiology (TEE)	93	93.0

Patient characteristics of enrolled patients in table 3 were (n=100). The frequency of chest pain were present in 98 patients and its percentage were 98% and the frequency of chest pain were not present in 2 patients and its percentage were 2%. The frequency of hypertension were present in 81 patients and its percentage were 81% and the frequency of hypertension were not present in 19 patients and its percentage were 19%.

The frequency of diabetes were present in 42 patients and its percentage were 42% and the frequency of diabetes were not present in 58 patients and its percentage were 58%.The frequency of Coronary artery disease were present in 30 patients and its percentage were 30% and the frequency of Coronary artery disease were not present in 70 patients and its percentage were 70%.

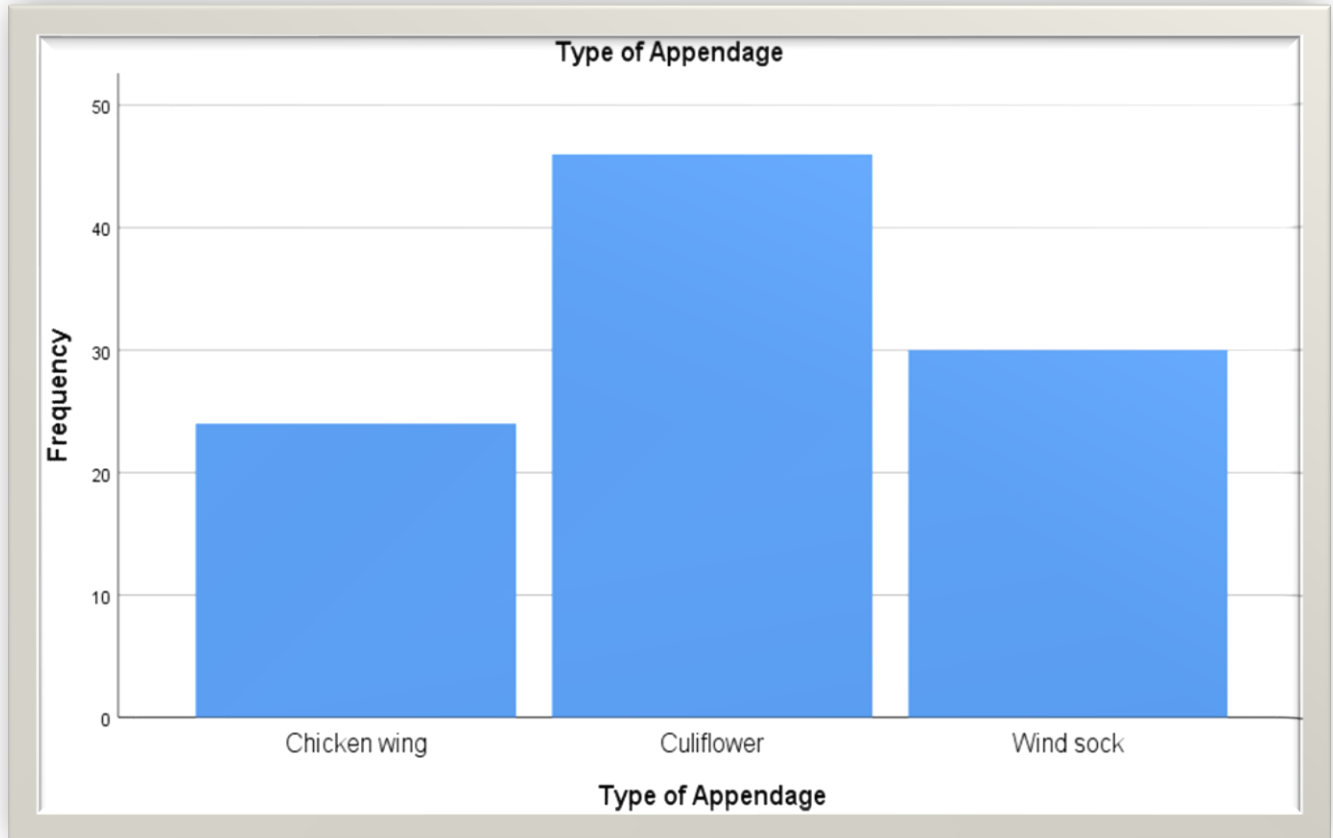
The frequency of heart failure were present in 25patients and its percentage were 25% and the frequency of Coronary artery disease were not present in 75 patients and its percentage were 75%. The frequency of the watchman device were used 86 patients and its percentage were 86% and The frequency of the Amplatzer were used 14 patients and its percentage were 14%. P-values were < 0.05.

The frequency of type of appendage chicken wing were 24 and its percentage were 24%. The frequency of type of appendage cauliflower were 46 and its percentage were 46%. The frequency of type of appendage wingsockg were 30 and its percentage were 30%.The frequency of diagnostic test trans-oesophageal echocardiology (TEE) were 93 and its percentage were 93%. The frequency of diagnostic test Cardiac CT were 7 and its percentage were 7%.

**Table 4:** Complications of enrolled patients (n=100)

Complications	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Pericardial Effusion</b>	3	3.0	3.0	96.0
<b>Thrombus Formation</b>	4	4.0	4.0	100.0
Total	100	100.0	100.0	

In the above table 4, the frequency of complications of pericardial effusion were 3 and the percentage were 3%. The cumulative percent were the same 3%. the frequency of complications of thrombus formation were 4 and the percentage were 4%. The cumulative percent were the same 4%. Total patients were enrolled 100.



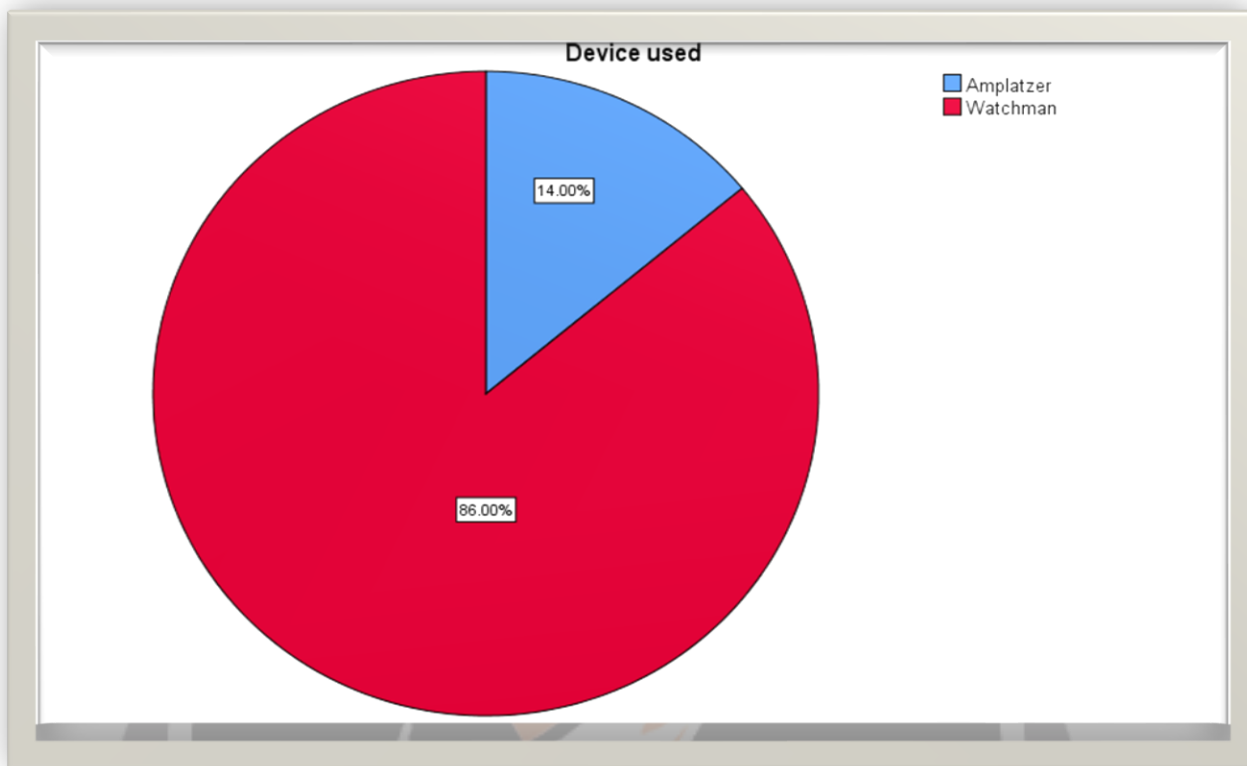
**Figure 2:** Bar chart of Type of appendage.

In Figure 2, we can see the frequency of chicken wing, cauliflower, and wind sock.

**Figure 3:** Bar chart of Devices used.

In Figure 3, we can see the percentage of watchman which is 86% and the percentage of Amplatzer is 14 %.

### Discussion



Left atrial appendage (LAA) has a highly variable anatomical structure and may offer various procedural challenges. With more operator expertise and a lower risk of problems in the real-world scenario, recent studies are displaying encouraging outcomes. It is advisable to promote thorough patient evaluation before undertaking LAA closure. Patients with a high risk of procedural complications and overall prognosis should be able to be identified by this. Additionally, future clinical research and registries ought to keep advancing the design of LAA closure devices.[22] The Watchman device's long-term cost-effectiveness is amply demonstrated by available data. After four years, the cost-effectiveness of the LAAO is higher than that of the NOACs. As the usage of these devices grows, efforts should be made to develop strong clinical and financial models that will aid in our understanding of the long-term economic implications of these devices.[23–24] A few significant research are now underway that have the potential to alter the application and practice of LAAO. In August 2016, participants were randomly assigned 1:1 to either the Amulet device or the Watchman device in the Amplatzer Amulet LAA Occluder study (Amulet IDE), a prospective randomized multicenter global experiment. In patients with nonvalvular AF, the Amulet device's performance will be compared to that of the Watchman LAA closure device in order to assess its safety and effectiveness .[25] A composite of severe bleeding, all-cause death, or procedure-related complications through 12 months is the primary safety endpoint; a composite of ischemic stroke or systemic embolism through 18 months is the primary efficacy goal. Interventional Left Atrial Appendage Closure vs. Novel Anticoagulation Agents in High-risk Patients with Atrial Fibrillation is a significant ongoing clinical trial that is now accepting new participants.[26] A total of 400 patients are being recruited into the NOAC and LAAO (Watchman or Amulet) groups in this randomized multicenter open label experiment. The combination of stroke, another systemic cardiovascular event, clinically significant bleeding, cardiovascular death, or complications from the surgery or device is the main outcome.[27]

### CONCLUSION

We concluded that left arterial appendage occlusion (LAAO) is the best strategy for stroke reduction in old age people. The left arterial appendage occlusion (LAAO) procedure is more beneficial as compared to open surgery. Patients who have left arterial appendage have chest pain and hypertension. This type of disease is more common in old age people. In our study males were more as compared to females.

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