



## Investigating the relationship between the shape of the left atrial appendage and the incidence of atrial fibrillation in patients diagnosed with atrial fibrillation

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### ABSTRACT

**Objective(s):** Appendage is the growth of the left atrium, which is different in terms of shape and size. This research aimed to investigate the relationship between the shape of the left atrium appendage and atrial fibrillation incidence.

**Methods:** In a cross-sectional study, using the census method, 25 patients diagnosed with atrial fibrillation and a candidate for cardioversion were examined for the shape of the left atrial fibrillation in Farshchian Heart Hospital in Hamadan from 2021 to 2022. Three-dimensional echocardiography with an esophageal probe was used to detect LAA morphology. Data, after recording in the checklist, were analyzed with SPSS software (version 26).

**Results:** Patients had a mean age of  $56.64 \pm 12.3$  years. Males accounted for 32% of the patients and females for 68%. The frequency of chicken-wing, cactus, cauliflower, and windsock in the left atrium was 52%, 40%, 4%, and 4%, respectively. The mean and standard deviation of blood flow velocity in chicken-wing, cactus, cauliflower, and windsock forms were  $14.92 \pm 3.90$ ,  $40.70 \pm 9.62$ , 23.00, and 32.00 cm/s, respectively ( $P < 0.001$ ). Shape of the left atrial appendage had no significant difference with the type of atrial fibrillation regarding age, gender, diabetes, and blood pressure ( $P < 0.05$  for all).

**Conclusion:** In patients with atrial fibrillation, the frequency of left atrial appendage morphology is different. Chicken-wing and cactus forms were the most common forms of left atrial appendage in patients diagnosed with atrial fibrillation. The shape of the left atrium was significantly related to the flow rate, which seems to help predict thrombosis and atrial fibrillation.

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### Introduction

A prevalent rapid heart rhythm disorder is atrial fibrillation (AF) (1), in which the left atrial appendage (LAA) has a substantial impact, and changes in its structure and anatomy are closely related to the initiation, advancement, and recurrence of AF (2). In a regular heart rhythm, LAA contracts and relaxes rhythmically. Conversely, in AF, which causes irregular contractions of the left

atrium (LA), the LAA loses its typical contraction pattern (3, 4). This leads to decreased contraction strength of the LAA wall and incomplete blood emptying from the LAA (5). Incomplete emptying, slow blood flow, and damage to the cardiovascular endothelium lead to morphologic changes of the LAA, which are likely to result in thrombosis and severe ischemic stroke events. Despite the highly complicated mechanism of initiation of thrombosis, the LAA morphologic change plays a crucial role in

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