Recurrence of atrial fibrillation after catheter ablation in overweight patients

Version 2

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Abstract

**Introduction:** Overweight and obesity are associated with onset and progression of atrial fibrillation (AF). Catheter ablation is considered a safe and curative therapy in advanced stages of AF. In this retrospective study we wanted to investigate the impact of overweight and obesity on AF-recurrence after ablation, in patients with symptomatic AF undergoing successful elective catheter ablation.

**Methods:** The study population included 90 patients with symptomatic AF who received elective catheter ablation at University Hospital Örebro between 2015-2016. Patients were categorized into 3 study groups: Lean (<25.0 kg/m²), Overweight (25.0-29.9 kg/m²) and Obese (≥30 kg/m²). Recurrence was defined as clinical symptoms and electrocardiogram (ECG) recording consistent with AF within 3 -12 months after ablation. Fisher’s exact test was used to compare AF-recurrence between BMI groups.

**Results:** Out of 90 patients included, 3 were excluded due to missing data. BMI-categories consisted of 17 (19.6%) lean, 47 (54.0%) overweight and 23 (26.4%) obese patients. Recurrence rates in the different groups were 5.9% in the lean group, 29.8% in the overweight group and 17.4% in the obese group. Compared to lean patients, AF-recurrence was statistically significantly higher in the overweight population (p=0.04), but not in the obese population (p=0.3). BMI was not an independent predictor of AF-recurrence after ablation in the univariate (p=0.52) and multivariate logistic regression analysis (p=0.18).

**Conclusion:** Compared to lean patients, recurrence of AF after catheter ablation was statistically significantly higher in overweight patients, but not in obese patients. BMI seemed not to be an independent predictor of AF-recurrence.

**Key words:** Atrial fibrillation, Catheter ablation, Overweight, Obesity, Recurrence
Introduction

Atrial fibrillation (AF) is the most common arrhythmia with a prevalence of 2% and an incidence ranging between 0.23 and 0.41 per 1000 person/years in western countries. In the last two decades AF has become a significant public health problem causing increased rates of mortality, morbidity and health care costs [1,2]. According to experts there is an on-going AF epidemic and in the next three decades the prevalence is expected to increase by almost 3-fold [3]. Several risk factors such as; age, sex, smoking, obesity, diabetes mellitus, obstructive apnoea and high blood pressure are associated with an increased risk of developing AF [4]. Obesity has become a worldwide increasing trend, resulting in a rising prevalence of cardiovascular disease within the general population [5]. Associations between obesity (when using Body Mass Index, BMI, as a surrogate marker) and AF have been made in numerous studies [6,7,8]. In the Framingham Heart Study results show that obesity independently accounts for a 50% increased risk of developing AF [6]. Another cohort study demonstrates a 5% increased risk of incident AF with each unit (1kg/m²) increase in BMI [7]. The underlying mechanisms of obesity and onset of AF are not fully understood, however a review study suggests that weight gain and obesity are associated with “structural and functional changes of the cardiovascular system including left atrial and ventricular remodelling, haemodynamic alterations, autonomic dysfunction, and diastolic dysfunction” [9]. Moreover, obesity seems to have an impact on the progression of AF. In a longitudinal cohort study by Teresa S M Tsang et al. results demonstrate a relationship between elevated BMI and higher rates of progression from paroxysmal to permanent AF [10].

Current treatment strategies for AF include anticoagulation, rate- and rhythm control [1]. Patients with AF run a higher risk of having a stroke [2], due to being more susceptible to blood clot formation in the atria. Therefore, oral anticoagulation (OAC) therapy with either warfarin or NOAC (Novel Oral Anticoagulants) is essential to prevent this outcome.

CHA₂DS₂-VASc score is a clinical predictor, which estimates the risk of stroke in AF patients and is used to determine when a patient with AF needs to start OAC. Pharmacological intervention with anti-arrhythmic drugs can be utilized in patients with new onset AF to control heart rate and rhythm. If the AF has lasted longer than 7 days chances are very low that a spontaneous conversion to normal rhythm will occur. In these instances cardioversion, in which the patient receives an electrical shock, is usually attempted. When AF patients experience severe symptoms or when medical management has not been successful, catheter
Ablation (CA) is an alternative [11]. CA is superior to antiarrhythmic drugs [13] and considered an effective and safe curative therapy for AF [12].

However, success rates of AF-CA are largely dependent on the patient population and its clinical characteristics [13]. Several studies on the association between overweight/obesity and AF recurrence after ablation seem to have similar findings and conclusions [14,15,16,17]. Some prospective studies demonstrate that BMI independently predict recurrence after AF-CA [14,15]. On the contrary, some studies indicate that BMI is not an independent predictor of AF recurrence following ablation [18,19]. Although a majority of studies indicate a significant association between obesity and AF recurrence after ablation, there are still conflicting opinions on this subject. In this cohort study we tested the hypothesis that overweight/obesity is significantly associated with higher rates of AF recurrence after catheter ablation.

Aim

The primary aim of this study was to investigate the impact of overweight and obesity on AF recurrence in patients with AF who underwent a successful elective catheter ablation. Secondary aim was to evaluate the predictive ability of BMI for AF-recurrence.

Materials And Methods

Study Population

In this cohort study, we identified 90 patients with symptomatic atrial fibrillation from both region Värmland and Örebro, who were referred for and received elective catheter ablation treatment at Department of Cardiology, University Hospital Örebro between 2015-2016. The study population was assembled from a register used in a large on-going study. All data were obtained from patients’ medical records and the hospital patient database. Patients with symptomatic paroxysmal and persistent/permanent AF were included. Paroxysmal AF was defined as self-terminating episodes shorter than 7 days. Persistent AF was considered when duration lasted >7 days, or >1 month in permanent AF, and required active therapy with anti-arrhythmic drugs (AAD’s) or electrical cardioversion. Having undergone catheter ablation earlier was no exclusion criteria. BMI at the time of ablation was used as a surrogate marker for overweight/obesity. It was calculated by dividing body weight in kilograms by the square
of the height in meters. Depending on BMI patients were categorized into 3 study groups: lean (<25.0 kg/m²), overweight (25.0-29.9 kg/m²) and obese (≥30 kg/m²).

**Catheter Ablation Procedure**

The procedure was performed on uninterrupted oral anticoagulation with any of NOAC-agents or warfarin within the therapeutic international normalized ratio interval, and at least four weeks before ablation. The day before procedure all patients were evaluated with echocardiography and computer tomography (CT)-scan. At ablation real-time 3D electroanatomic mapping was performed (CARTO Merge, Biosense Webster, Diamond Bar, CA, USA). Circumferential lines according to encircling were produced around each pair of pulmonary vein (PV) ostia. The end point was the absence of PV signals for at least 15 minutes during sinus rhythm (SR). Direct current cardioversion was performed when needed. After ablation all patients were hospitalized for at least 24 hours for continuous monitoring of heart rate and rhythm before discharge. Antiarrhythmic drugs and oral anticoagulation were continued for three to six months after the ablation and then re-evaluated. Withdrawal of AADs was guided by symptoms and intermittent electrocardiogram (ECG) monitoring rather than the actual AF burden. Anticoagulation therapy was based on the CHA₂DS₂-VASc score according to actual guidelines and regardless of arrhythmia status.

**Follow Up**

Patients were informed to return 3 months after ablation for a follow up visit to a nurse. During this visit data from ECG event recorder monitor (R-test) were collected and reported to the responsible doctor for evaluation. Patients were then instructed to return for a 6-month post-ablation follow up to a cardiologist. This visit consisted of evaluating patient history, a physical examination and 12-lead ECG examination. Finally patients were asked to return for a 12-month follow up after ablation, during which patient history and physical examination were evaluated and ECG and echocardiography were performed. Patients who were not residents in Örebro had follow up visits in their respective home clinics. These patients’ medical records were then sent to the clinic in Örebro for research purposes. Missing data from all follow up visits resulted in exclusion. End point of follow up was set to 12 months after ablation, any follow up clinical data past this point was not taken into account. In case patients experienced complications after ablation or relapse of AF-symptoms they were informed to seek medical care. Recurrence was defined as clinical symptoms and ECG
image consistent with atrial fibrillation. Time to recurrence was presented as failure within 3-12 months after ablation. The initial three-month period post ablation was considered a blanking period.

**Statistical analysis**

Categorical variables were described as numbers and percentage and continuous variables were described as mean ± SD. To assess differences in categorical variables, Fisher’s exact test or Chi-square test were performed. Differences in continuous variables among the BMI groups were analysed using ANOVA-test for parametric and Kruskal Wallis-test for non-parametric data. Risk relationships, comparing recurrence between different BMI groups, were presented as relative risk (RR) with 95% confidence interval. Univariate and backward stepwise multivariate logistic regression analysis were used to determine predictors of AF-recurrence. BMI was considered a linear and independent variable in the regression analysis. In the backward stepwise multivariate regression an initial analysis of all variables was made to detect the most significant variables, which BMI then would be adjusted for. A two-sided p-value of <0.05 was considered statistically significant. The statistical analyses were performed using STATA 16.1 - StataCorp 4905 Lakeway Drive College Station, Texas 77845 USA.

**Ethical Consideration**

The present study is part of a greater on-going study, which the Uppsala ethical board has given approval for (Dnr 2012/066/1). All patients gave their written informed consent before enrolment in the study and could at any point withdraw their consent. All data was coded and the keycode needed for access was kept in a classified envelope put in a locked room at the department of cardiology at University Hospital Örebro.
Results

Baseline Patient Characteristics

Out of 90 patients included in this study, 3 patients were excluded due to missing data from all follow up visits (N = 87). All baseline patient characteristics and clinical variables within the BMI groups are shown in table 1. Of 87 patients with a minimum of 3 months follow up, 17 (19.6%) were lean, 47 (54.0%) overweight and 23 (26.4%) obese. Majority of the study population among all groups consisted of male patients: 70.6%, 80.9% and 65.2% respectively. Mean ages in the different groups were: 66.1 ± 6.4 in the lean group, 62.2 ± 8.9 in the overweight group and 60.7 ± 9.3 in the obese group (p=0.1). Groups differed from each other regarding to BMI and the difference was statistically significant (p<0.001). Obese patients were more likely to have hypertension (p=0.007) and heart failure (p=0.02). In the CHA₂DS₂-VASc score a statistically significant difference between all groups was noted (p=0.03). No differences were observed within echocardiographic parameters including ejection fraction (EF%), left ventricular end diastolic diameter (LVEDd), left atrial area (LA area), right atrial area (RA area). At index ablation, treatment with angiotensin converting enzyme inhibitor/angiotensin receptor blocker (ACEI/ARB) (p<0.001) and diuretics (p=0.02) were statistically significantly more common in the obese group. The use of statins before ablation was higher in the lean group compared to the overweight and obese patients (p=0.02).
Table 1. Baseline Patient Characteristics and Clinical Variables

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Lean (BMI&lt;25.0)</th>
<th>Overweight (BMI 25.0-29.9)</th>
<th>Obese (BMI≥30)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>17 (19.6)</td>
<td>47 (54.0)</td>
<td>23 (26.4)</td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>66.1 ± 6.4</td>
<td>62.2 ± 8.9</td>
<td>60.7 ± 9.3</td>
<td>0.1</td>
</tr>
<tr>
<td>Male sex, n(%)</td>
<td>12 (70.6)</td>
<td>38 (80.9)</td>
<td>15 (65.2)</td>
<td>0.3</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>23.8 ± 1.1</td>
<td>26.9 ± 1.4</td>
<td>32.9 ± 3.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hypertension, n(%)</td>
<td>9 (52.9)</td>
<td>16 (34.0)</td>
<td>17 (73.9)</td>
<td>0.007</td>
</tr>
<tr>
<td>Heart failure, n(%)</td>
<td>2 (11.8)</td>
<td>0 (0)</td>
<td>3 (13.4)</td>
<td>0.02</td>
</tr>
<tr>
<td>Diabetes mellitus, n(%)</td>
<td>2 (11.8)</td>
<td>2 (4.3)</td>
<td>2 (8.7)</td>
<td>0.5</td>
</tr>
<tr>
<td>Stroke, n(%)</td>
<td>1 (5.9)</td>
<td>0 (0)</td>
<td>1 (4.4)</td>
<td>0.2</td>
</tr>
<tr>
<td>Coronary artery disease, n(%)</td>
<td>1 (5.9)</td>
<td>1 (2.1)</td>
<td>0 (0)</td>
<td>0.4</td>
</tr>
<tr>
<td>Peripheral artery disease, n(%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>OSAS, n(%)</td>
<td>0 (0)</td>
<td>2 (4.3)</td>
<td>0 (0)</td>
<td>1.0</td>
</tr>
<tr>
<td>Valvular heart disease, n(%)</td>
<td>0 (0)</td>
<td>3 (6.4)</td>
<td>0 (0)</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>CHA²DS²-VASc score</strong></td>
<td>2.1 ± 1.3</td>
<td>1.1 ± 0.98</td>
<td>1.8 ± 1.2</td>
<td>0.03</td>
</tr>
</tbody>
</table>

**Echocardiographic parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Lean (BMI&lt;25.0)</th>
<th>Overweight (BMI 25.0-29.9)</th>
<th>Obese (BMI≥30)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF (%)</td>
<td>56.5 ± 9.6</td>
<td>59.3 ± 5.6</td>
<td>59.5 ± 5.8</td>
<td>0.8</td>
</tr>
<tr>
<td>LVEDd, mm</td>
<td>51.6 ± 5.9</td>
<td>51.3 ± 3.8</td>
<td>51.9 ± 4.9</td>
<td>0.9</td>
</tr>
<tr>
<td>LA area, cm²</td>
<td>24.5 ± 5.6</td>
<td>24.8 ± 4.2</td>
<td>25.8 ± 5.5</td>
<td>0.6</td>
</tr>
<tr>
<td>RA area, cm²</td>
<td>21.6 ± 5.7</td>
<td>21.3 ± 4.7</td>
<td>21.9 ± 5.3</td>
<td>0.9</td>
</tr>
</tbody>
</table>

**Pulmonary vein anatomy**

| Normal, n(%)              | 12 (70.6)       | 45 (95.7)                  | 17 (85.1)      | 0.004   |
| Abnormal n(%)             | 5 (29.4)        | 2 (4.3)                    | 6 (14.9)       | 0.004   |

**Treatment before ablation**

| Beta-blocker, n(%)        | 12 (70.6)       | 34 (73.9)                  | 22 (95.7)      | 0.07    |
| Amiodarone, n(%)          | 4 (23.5)        | 14 (30.4)                  | 10 (43.5)      | 0.4     |
| Dronedarone, n(%)         | 3 (17.7)        | 5 (10.9)                   | 4 (17.4)       | 0.6     |
| Flecainide, n(%)          | 4 (23.5)        | 4 (8.7)                    | 5 (21.7)       | 0.2     |
| Other antiarrhythmic agents, n(%) | 0 (0)   | 3 (6.5)                    | 0 (0)          | 0.4     |
| ACEI/ARB, n(%)            | 11 (64.7)       | 10 (21.7)                  | 16 (69.6)      | <0.001  |
| Diuretics, n(%)           | 3 (17.7)        | 5 (10.9)                   | 9 (39.1)       | 0.02    |
| VKA, n(%)                 | 4 (23.5)        | 11 (23.9)                  | 7 (30.4)       | 0.8     |
| NOAC, n(%)                | 13 (76.5)       | 35 (76.1)                  | 16 (69.6)      | 0.8     |
| Statins, n(%)             | 9 (52.9)        | 8 (17.4)                   | 6 (26.1)       | 0.02    |

Values are n (%) or mean ± SD. Fisher’s exact test or Chi-square test for P-value on categorical variables. ANOVA test and Kruskal Wallis test for p-value on continuous variables.

**Abbreviations:** SD, Standard Deviation; OSAS, Obstructive Sleep Apnea Syndrom; EF, Ejection Fraction; LVEDd, Left Ventricular End Diastolic Diameter; LA, Left Atrium; RA, Right Atrium; ACEI, Angiotensin Converting Enzyme Inhibitor; ARB, Angiotensin Receptor Blocker; VKA, Vitamine K Antagonist; NOAC, Novel Oral Anticoagulants.
**Follow Up**

Greatest loss to follow up was seen at 12 months post ablation, with only 70.6% in the lean group, 44.7% in the overweight group and 56.5% in the obese group attending the 12-month follow up visit. Follow up rates after ablation are shown in table 2.

Table 2. Follow up rate at 3-, 6- and 12 months after ablation

<table>
<thead>
<tr>
<th>Follow up visits</th>
<th>Lean (BMI&lt;25.0)</th>
<th>Overweight (BMI 25.0-29.9)</th>
<th>Obese (BMI≥30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N(%)</td>
<td>17 (19.6)</td>
<td>47 (54.0)</td>
<td>23 (26.4)</td>
</tr>
<tr>
<td>3 month follow-up, n(%)</td>
<td>17 (100)</td>
<td>46 (97.9)</td>
<td>21 (91.3)</td>
</tr>
<tr>
<td>6 month follow-up, n(%)</td>
<td>13 (76.4)</td>
<td>43 (91.5)</td>
<td>18 (78.3)</td>
</tr>
<tr>
<td>12 month follow-up, n(%)</td>
<td>12 (70.6)</td>
<td>21 (44.7)</td>
<td>13 (56.5)</td>
</tr>
</tbody>
</table>

*Values are n (%)*

**Atrial Fibrillation Recurrence**

Total AF recurrence in all patients within time period 3-12 months after ablation was 19 (21.8%). Recurrence was observed highest in the overweight group 14 (29.8%), compared to 1 (5.9%) in the lean group and 4 (17.4%) in the obese group. Fig. 1 illustrates the recurrence rate in each BMI category during the follow up period. A statistically significant difference in recurrence rate was noted between the overweight and lean population (p=0.04). However, recurrence rate in the obese vs. lean population (p=0.3) and overweight vs. obese population (p=0.2) was not statistically significant (table 3). The relative risk (RR) comparing recurrence in overweight vs. lean group was 5.01 (0.72-35.60), in obese vs. lean group 2.95 (0.36-24.13) and in obese vs. overweight 0.58 (0.22-1.58).
Predictors Of Recurrence

Univariate logistic regression demonstrated that BMI as a linear independent variable could not significantly predict the outcome of ablation OR 1.29 (95% CI 0.60-2.76) p=0.52. However, female gender as an independent variable in the univariate regression seemed to be a significant predictor of AF-recurrence OR 0.12 (95% CI 0.02-0.99) p=0.049. In the initial backward stepwise multivariate regression analysis all patient characteristics and clinical variables were analysed individually. The most significant variables were then chosen and adjusted for in the multivariate regression; these were age, sex (female), CHA2DS2-VASc score (1 and 2 points), diabetes mellitus, heart failure, hypertension, LVEDd and RA area. When adjusted for only female gender, BMI could not predict recurrence OR 1.40 (95% CI 0.62-3.22) p=0.41. Similarly, when adjusted for all chosen variables, BMI could not predict AF-recurrence the first year after ablation OR 2.25 (95% CI 0.69-7.27) p=0.18.

Table 3. AF-recurrence comparison between BMI groups during 3-12 months after ablation

<table>
<thead>
<tr>
<th>BMI groups</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight vs Lean</td>
<td>0.04</td>
</tr>
<tr>
<td>Obese vs Lean</td>
<td>0.3</td>
</tr>
<tr>
<td>Obese vs Overweight</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Fisher's exact test for p-values

Figure 1. Numbers and percentages of patients with recurrence of atrial fibrillation within 3-12 months after ablation.
Discussion

In our study the highest recurrence rate of AF was observed in the overweight population, with 29.8% of patients experiencing a relapse of AF-symptoms. Compared to lean patients, recurrence was significantly higher in overweight patients, but not in obese patients. BMI when adjusted could not predict the recurrence of AF during the first year after ablation.

Obese patients in this study did not have higher recurrence of AF during the follow-up, but they seemed to have more prevalent comorbidities and other risk factors such as hypertension and heart failure. On the other hand, normal weight patients were on average older than obese patients. Also a greater amount of patients with normal weight seemed to have abnormal pulmonary vein anatomy. Surprisingly, echocardiographic parameters did not differ among the BMI groups, which would have been expected considering the effect of obesity on the cardiovascular system [9]. However, in some studies there was no statistically significant higher recurrence in overweight and obese subjects, although showing greater difference in comorbidity and echocardiographic parameters among the groups compared to our study. In a prospective study including 523 patients who were followed up for 24 months, significantly higher recurrence could neither be found in the overweight nor the obese population (p=0.31) [20]. Similar findings were demonstrated in another study where AF-recurrence rate between normal weight, overweight and obese population, after a mean follow-up period of 432 days from the index ablation, showed no statistically significant difference (p=0.258) [19]. Likewise in a study where subjects were categorized into a normal BMI (<25 kg/m2) group and a high BMI (>25 kg/m2) group, no significant difference in AF recurrence after ablation could be seen [21].

There are certainly clinical and procedural factors, which affect the outcome after ablation that we may not have taken into consideration, hence our results. Contrary to previous mentioned studies, several others demonstrate a statistically significant correlation between increasing BMI and higher recurrence rates. In our study overweight patients had 29.8% recurrence while only 5.9% in normal weight patients recurred, thus showing a statistically significant difference (p=0.04). In a European observational multicentre study AF-recurrence slightly increased in the pre-obese group (BMI 25-30 kg/m2) 35.7% vs. 35.2% in normal weight group (BMI 18.5-25 kg/m2) and recurrence progressively increased with increasing BMI group at >12 months post-ablation (P<0.001) [22]. Even after very long follow up time,
notable differences in AF-recurrence among BMI-groups have been consistent. Bunch et al. demonstrated in a multicentre study that AF-recurrence increased significantly with increasing BMI-category at 3 years post-ablation (p=0.02) [23]. These findings suggest that obese subjects in the present study might have shown a greater recurrence rate if followed up for a longer period of time. Other statistically significant findings were observed in a meta-analysis of observational studies where elevated BMI (>25 kg/m2) increased the risk of recurrence compared to normal BMI (RR = 1.308, 95% CI: 1.036-1.651, P = 0.02). However, the relative risk when comparing only overweight and normal weight patients was not statistically significant RR = 1.270, 95% CI 0: 961-1.679, P = 0.093. Neither was the relative risk between the overweight and the obese group (RR=1.116, p=0.397) [16]. Results of relative risks are similar to those observed in our study.

Numerous predictors of AF-recurrence after ablation have been studied and identified. In our study population, univariate and multivariate analyses indicated that BMI alone was not a good predictor of AF-recurrence. This result could be attested to small differences in clinical characteristics among BMI-groups, but also the lack of documented data (e.g. procedural factors, AF-type), which could have contributed to our outcome. Thus, several clinical and procedural factors should be taken into account and adjusted for, to further investigate the predictive ability of BMI on recurrence [24]. However, similar results to our study have been observed in other publications. Letsas et al demonstrated in a study including 226 patients with symptomatic, drug-refractory AF that BMI was not an independent predictor of AF-recurrence following catheter ablation [19]. The observed population in Letsas et al study is comparable to our population, where patients with higher BMI were on average younger and more comorbid. A longer follow up period would possibly have affected the predictive ability of BMI in our population, since a review study indicated that obesity was a predictor of very late recurrence (>5 years post-ablation) [24]. Moreover, a retrospective single-centre cohort who investigated the effect of BMI on very late recurrence (>12 months after ablation) showed a similar trend, however no statistical significance was noted (p=0.06) [18].

A couple of studies have demonstrated BMI as a statistically significant predictor of AF-recurrence [14,15,17,25]. In a prospective study by Cai et al. findings showed that overweight/obesity (OR= 4.71, 95% CI 1.71-12.98, P=0.003) was an independent predictor of AF recurrence after ablation [14]. Although a relatively small population was included (n=186), several factors seemed to independently predict recurrence. Likewise in another
small prospective study, results demonstrated that only BMI independently predicted recurrence after AF-CA (OR 1.11, CI: 1.00–1.21, P = 0.03) [15]. In the present study BMI could not predict recurrence, however female gender seemed to be associated with a lower risk of AF recurrence OR 0.12 (p=0.049). Interestingly, in a large patient cohort multivariate analysis showed opposite results to ours, with female sex being a strong predictor of increased AF-recurrence OR 1.27 (1.11–1.46) (p<0.001) [26]. Nevertheless, this could be explained by a higher percentage of recurrence among women in the study population.

This retrospective cohort study was performed on a small study population sample at a single centre in Sweden. Thus, results only reflect the recurrence rates in the observed population and might not be generalized. Although recurrence rate was not statistically significant in the obese group, our results indicate a trend towards higher AF-recurrence post ablation in patient groups with elevated BMI. More accurate outcome could possibly been achieved if the different populations were matched at baseline, in terms of population size, gender, age and comorbidity. Also if several other factors would have been taken into consideration, such as procedural variables, AF-duration, AF-type and weight management after ablation. We cannot ignore the possibility of weight reduction after ablation in some patients, especially in the obese group, which might have affected the results. Moreover, patients could have experienced asymptomatic AF in between follow up visits, therefore making it hard to detect actual recurrence. Optimally a prospective study design would be more suiting to further investigate this subject. In this study we chose BMI as a surrogate marker for overweight/obesity, however other measurements like waist-to-hip ratio and waist circumference could better have reflected the degree of adiposity and given a more accurate assessment of recurrence risk [27]. The predictive ability of BMI for AF-recurrence was not statistically significant in the univariate and multivariate analyses in our study. A larger and multi-centre study with greater data inclusion would increase the chance of achieving a more precise result, since overweight and obesity have been shown to be important predictors of AF-recurrence in several larger studies previously.
Conclusion

Compared to lean patients, the recurrence of AF after ablation was significantly higher in overweight patients, but not in obese patients. BMI when adjusted for several clinical variables could not alone predict the AF-recurrence during the first year after catheter ablation. The impact of overweight and obesity on AF-recurrence needs to be further investigated in larger and well-controlled prospective studies.
References


Förmaksflimmeråterfall hos överviktiga patienter efter kateterablation

Förmaksflimmer utgör den vanligaste hjärtrytmrubbningen i västvärlden och förväntas öka de kommande decennierna. Många riskfaktorer har associerats med förmaksflimmer. Övervikt och fetma hör till de viktigaste riskfaktorerna för uppkomst samt progression utav förmaksflimmer. Hos patienter med svårt förmaksflimmer där behandling med läkemedel mot hjärtrytmrubbning inte har varit hjälpsamt, använder man sig utav en behandlingsmetod som kallas för kateterablation. Detta har visat sig vara en effektiv och botande behandling vid svårare former av förmaksflimmer.


Vår studie belyser de problematiska konsekvenserna utav övervikt och fetma vid förmaksflimmer och syftar till att informera om betydelsen av viktreglering för att bättre lyckas med kateterablation-behandling mot förmaksflimmer.
Dear editors of British Journal of Cardiology,

We would like to submit our manuscript entitled “Atrial fibrillation recurrence in overweight patients after catheter ablation”. In this paper we investigated the impact of overweight and obesity on atrial fibrillation recurrence in patients with atrial fibrillation undergoing a successful catheter ablation. We found that recurrence was significantly higher in overweight patients, but not in obese patients. Also BMI did not have a significant predictive value on the outcome after ablation. Our findings will be of interest to your readers since previous research have shown conflicting results. We did not find progressively increasing recurrence rate with increasing BMI similar to other studies. Thus, our results might open up for interesting discussions. Additionally these findings will provide useful information on important factors to include in future research on this topic.

We confirm that this is our original work, no publication has been made and currently there is no consideration for publication elsewhere. We declare that there are no conflicts of interest.

Please, consider publishing our manuscript in your journal.

Sincerely,

Ahmad Abou El Khair, Bachelor of Medicine
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Etisk reflektion
