

New onset cardiac arrhythmias after metabolic and bariatric surgery: an analysis of the Texas Public Use Data File

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INTRODUCTION

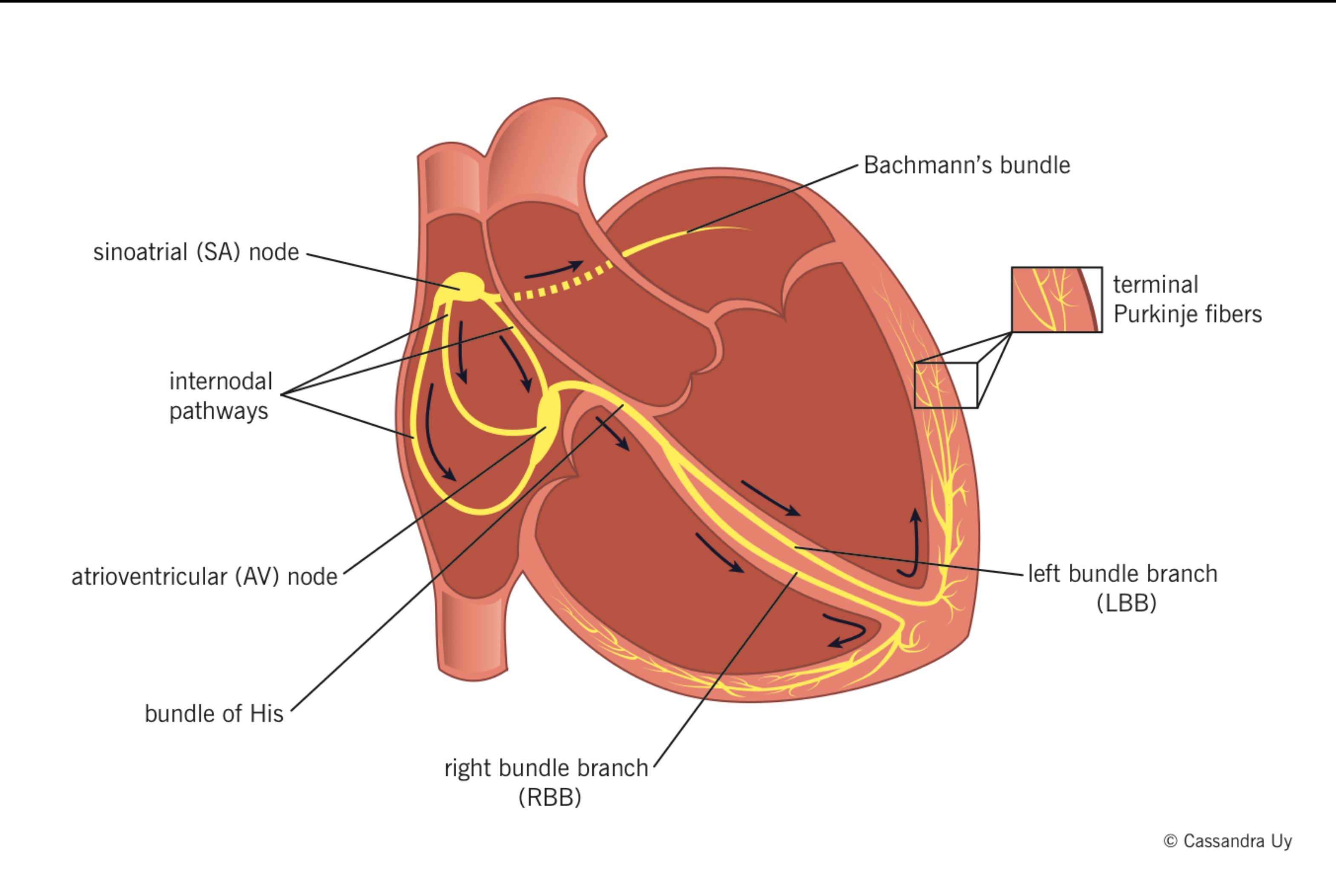
- Bariatric surgery has been shown to improve medical problems, including cardiac dysfunction, and morbidly obese patients have a higher rate of dysrrhythmias secondary to obesity
- A compounding problem with these patients is often the presence of obstructive sleep apnea (OSA) as it is associated with atrial tachyarrhythmias
- There is an improvement in left heart function, congestive heart failure and hypertension with the massive weight loss associated with metabolic and bariatric surgery (MBS), which can resolve cardiac dysfunction
- Studies also show increased incidence of post-bariatric surgical sinus bradycardia that is seen in many patients several months postoperatively, but there is scant literature on cardiac impacts of bariatric surgery
- We proposed using a large state administrative database to evaluate the incidence of cardiac arrhythmias after metabolic and bariatric surgery

METHODS AND PROCEDURES

- We studied the years 2016-18 using the Texas Inpatient and Outpatient Public Use Data File (PUDF)
- Inclusion criteria
 - Patients who had a history of bariatric surgery
 - Patients who underwent pacemaker insertion
- Quantitative variables were described using mean and standard deviation (SD)
- Categorical variables were described using frequency and proportion
- The student's t-test and chi-squared test were used to assess the differences across pacemaker installation
- These model estimates were reported as regression coefficients (RC) and prevalence ratios (PR) together with their 95% confidence intervals

RESULTS

- There were a total of 72,755 (72%) and 28,359 (28%) patients who underwent bariatric surgery and pacemaker respectively, before the exclusion criteria
- After excluding all non-bariatric patients, the prevalence of pacemaker installation was 0.3% (n = 238/ 72517) (roughly about 3 in every 1000 bariatric patients in our study received a pacemaker)
- The majority of the patients were white (72%), non-Hispanic (81%) and female (70%)
- The most common reason for pacemaker placement was sick sinus syndrome (51.5%), then sinus bradycardia (5.8%) followed by atrial fibrillation at 1.9%
- The most common arrhythmia overall was atrial fibrillation
- The PR for patients over 75 having a pacer placed was 9.37 (6.13, 14.33), which was significantly higher than younger patients
 - Patients aged 65-74 had a PR of 5.76 [(3.97, 8.37), $p < 0.001$]



DISCUSSION

- Nationwide, in 2016, there were 200,000 pacemakers placed
- Given the population of the United States at that time, that is a rate of 0.06%, substantially less than our group at 0.3%
- Beyond the obesity-associated electrostructural changes that are noted at the level of cardiac tissue, obesity has also been associated with dysfunction of the autonomic nervous system that manifests with increased sympathetic activity and reduced vagal tone
 - This may explain why SSS was the most common arrhythmia found in the Texas PUDF that required pacemaker placement
- Similar to obesity-driven changes, OSA-related arrhythmogenesis is also thought to be a consequence of both autonomic imbalance in favor of chronic excessive sympathetic stimulation and cardiac remodeling in the setting of oxidative stressors and comorbid conditions

CONCLUSION

- Three out of every 1000 bariatric patients in the study period required pacemaker placement (0.3%)
- The most common arrhythmia was atrial fibrillation
- The most common reason for pacemaker placement was sick sinus syndrome
- While these results do not indicate causality, they may demonstrate an association between MBS and arrhythmia
- The relationship between bariatric surgery and cardiac arrhythmias warrants further study.

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