Case Report

Anaesthetic management of a patient with sick sinus syndrome for vaginal hysterectomy

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Abstract

Background: Sick sinus syndrome is a generalised abnormality of cardiac impulse formation that may be caused either by an intrinsic disease of the sinus node, which makes it unable to perform its pacemaking function, or by extrinsic factors Intrinsic factors include degenerative fibrosis, ion channel dysfunction, and remodeling of the sinoatrial node. Extrinsic factors can be pharmacological, metabolic, or autonomic. It commonly affects elderly persons. Abnormalities encompassed by this syndrome include sinus bradycardia, sinus arrest or exit block, combinations of sinoatrial and atrioventricular nodal conduction disturbances and atrial tachyarrhythmias. Diagnosis of sick sinus syndrome can be difficult because of its nonspecific symptoms and elusive findings on an electrocardiogram or a Holter monitor. Here, we present the perioperative management of an elderly patient with sick sinus syndrome posted for vaginal hysterectomy.
Key Word: sick sinus syndrome for vaginal hysterectomy.

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INTRODUCTION

Sick sinus syndrome, also called sinus dysfunction or sinoatrial node disease is a group of abnormal heart rhythms presumably caused by a malfunction of the sinus node, the heart's primary pacemaker.
It can be intrinsic or extrinsic.
It is usually idiopathic, affects elderly.
We report the successful anaesthetic management of a patient with sick sinus syndrome, scheduled for vaginal hysterectomy.
The risks involved and the potential benefit of the use of regional versus general anaesthesia in this patient is discussed. The mainstay of treatment is atrial or dual-chamber pacemaker placement, which generally provides effective relief of symptoms and lowers the incidence of atrial fibrillation, thromboembolic events, heart failure and mortality, compared with ventricular pacemakers.

CASE REPORT

case presentation:
A 61 Year old female, weight 56kg came with history of 9 months amenorrhea with twin pregnancy with history of aortic and mitral valve replacement.

- History of present illness:
- She was a k/c/o hypothyroidism and was on Tablet. Thyronorm 25mcg
- Recently diagnosed with diabetes mellitus, For glycaemic control, she was started on Insulin.
- No history of chest pain, dyspnea, abdominal pain, breathlessness, pedal edema.

Physical examination:
Physical examination revealed her to be afebrile with regular, normal and good volume with 84 beats per minute and blood pressure of 130/70mmHg.
CVS: S1 and S2 heard with metallic grunt and there is parasternal heave. No evidence of pedal edema.
Respiratory

- Air entry equal both the sides with no added sounds
- The pre anaesthetic examination revealed an elderly female with co-morbid diseases, such as diabetes mellitus hypothyroidism having a good

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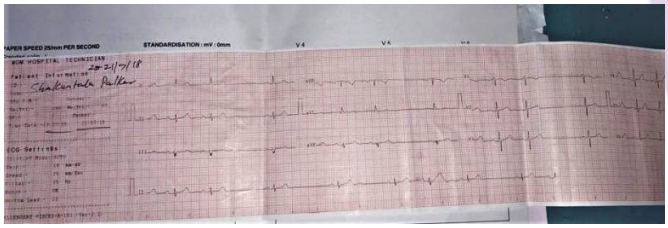
effort tolerance. Blood pressure was 140/90 mmHg and pulse rate was irregularly irregular with a range of 48–66/minute.

- Laboratory findings were within normal limits.
- An ECG showed bradycardia and irregular rate (see Figure 1).
- A chest X-ray disclosed no abnormality.
- In view of the irregularly irregular pulse and abnormal ECG in the elderly man, a cardiological evaluation was done.
- . In view of the abnormal ECG showing prolonged PR interval in this elderly woman, a cardiological evaluation was done.

  The cardiologist diagnosed it as sick sinus syndrome with sinus pause.

Investigations

investigations	laboratory values
Hb	11.6 g/dL
TLC	7400/L
PLATELETS	2,14,000/L
UREA	24.9mg/dL
CREATININE	0.8mg/dL
SODIUM	138mmol/L
POTASSIUM	4.4mmol/L
TOTAL BILURUBIN	0.4µmol/L
DIRECT BILURUBIN	0.1µmol/L
SGOT	206U/L
SGPT	27U/L
HbA1C	14
ALP	50 U/L
TSH	4.2 U/ml
INR	0.8



Monitors were connected as follows : noninvasive blood pressure, pulse oximetry and five lead ECG. The right radial artery was cannulated under local anaesthesia to monitor beat-to-beat information about atrioventricular synchrony. Transcutaneous paddles were attached and the pacer was set for synchronous, xed mode, 50 ppm, 40 mA. The ECG showed prolonged PR interval(ranging between 48 and 57 per minute) with wide QRS complexes alternating with sinus waves with impending haemodynamic instability. Anticipating the autonomic disturbances that could occur under anaesthesia, which may have significant haemodynamic implications when superimposed on the sick sinus syndrome, it was decided to insert a temporary transvenous demand pacemaker. The transvenous pacing wires were introduced via the right internal jugular vein under uoroscopic guidance. The heart rate was maintained around 70 beats per minute with continuous pacing. The anaesthetic plan was neuraxial spinal anaesthesia, as neuraxial anaesthesia limits exposure to opioids that exacerbate bradycardia. With the temporary pacemaker and invasive arterial monitoring in situ, Patient was induced under Spinal Anaesthesia between L3-L4 interspace with spinal needle gauge 25 with Inj. Bupivacaine(H) 0.5./.3ml+ Inj.Fentanyl 25ug. Anaesthesia and surgery were uneventful for the rest of the procedure. The patient was shifted to the postanaesthesia care unit with stable vitals, and adequate analgesia was provided during the postopertive period with 0.125% bupivacaine. The pacemaker was removed on the second postoperative day, pacing not being evident after the rst postoperative day. No episode of bradycardia was reported after pacemaker removal, and the pulse rate remained between 70 and 80 per minute with regular rhythm. The postoperative course was uncomplicated and the patient was discharged on the tenth postoperative day. Patient remained haemodynamically stable throughout the procedure. Her postoperative course was uneventful.

DISCUSSION

Patients with sick sinus syndrome are often asymptomatic or have symptoms that are mild and nonspecific.[2] Symptoms are related to the decreased cardiac output that occurs with the bradyarrhythmias or tachyarrhythmias. Most of the symptoms are caused by decreased cerebral perfusion, and 50% of patients have syncope or presyncope.[3] Sick sinus syndrome can produce a variety of ECG manifestations consisting of atrial bradyarrhythmias, atrial tachyarrhythmias and alternating bradyarrhythmias and tachyarrhythmias. Pharmacological treatment of sick sinus syndrome is usually unsuccessful.[4] Sick sinus syndrome in its chronic form runs an erratic course, with periods of normal SA node function and periods of abnormal function. If episodes of sinus bradycardia are frequent or symptoms such as dizzy spells, unexplained congestive cardiac failure, syncope or cardiac arrest occur, permanent pacing should be instituted.[5] According to several reports, there are some examinations that can unveil sick sinus syndrome preoperatively, such as routine preoperative 24-hour Holter ECG, evaluation of cardiovascular responses to beta stimulants or electrical atrial pacing6 and evaluation of the response to carotid massage. But employing these examinations routinely preoperatively poses several clinical problems, considering cost, time and invasiveness. It is most important to suspect the existence

of sinus nodal dysfunction if there is severe bradycardia during anaesthesia. Beta stimulants and an external cardiac pacemaker should always be prepared for immediate use. Experts do not agree on the criteria for temporary pacemaker placement. Unexpected interruption of the pacing can have serious consequences, and temporary pacemakers are known to malfunction unexpectedly, leading to sudden haemodynamic instability. The American Heart Association/ American College of Cardiology guidelines do not recommend permanent pacing in patients with asymptomatic complete heart block. In our case We preferred neuraxial anaesthesia over general anaesthesia as it avoids polypharmacy, pressor response, bradycardia and myocardial depression. Neuraxial anaesthesia itself can land the patient in bradycardia, it could be of limited use when the duration of surgery is too long and also causing decreased cardiac output as a result of decreased venous return. General anaesthesia could be of advantage when parasympathetic overactivity takes place as in a high spinal anaesthesia. General anaesthesia can cause cardiovascular instability, myoclonic movements caused by induction agents and neuromuscular blocking agents, mechanical ventilation can displace the pacing wire. pacing is most commonly used to treat symptomatic bradycardia for short periods. Toprak *et al* described two episodes of severe bradycardia in the same patient during general anaesthesia, the second of which they managed with a temporary pacemaker. Nakamura *et al* recommended temporary pacemakers for asymptomatic patients with sick sinus syndrome who were resistant to atropine. Furthermore, they suggested combining drug treatment with temporary pacing to treat vasovagal syncope. Çevik *et al* described the management of a parturient with asymptomatic complete heart block for whom they instituted temporary pacing before general anaesthesia to avoid bradyarrhythmias during Caesarean delivery and permanent pacing when she became symptomatic postoperatively. Arti cial pacemakers are well tolerated in elderly patients. In all patients with this syndrome, except those with chronic atrial brillation, atrial-based pacemakers are recommended. Compared with ventricular pacing, atrial pacing is associated with a lower incidence of thromboembolic complications, atrial brillation, heart failure, cardiovascular mortality and total morbidity. Intraoperative continuous ECG monitoring is essential to monitor pacemaker functioning. In addition, both electrical and mechanical evidence of the heart function should be monitored by manual palpation of the pulse, pulse oximetry, precordial stethoscope and arterial line, if indicated. The anaesthetic technique should be planned on a case-to-case basis. Both narcotic and inhalational techniques can be used successfully. These anaesthetic agents do not alter the current and voltage thresholds of the pacemaker. The muscle fasciculation induced by succinylcholine can be avoided by using a nondepolarising muscle relaxant or by defasiculating with a nondepolarising muscle relaxant before giving succinylcholine. Etomidate and ketamine should be avoided, as these cause myoclonic movements. Pacemaker function should be veri ed before and after initiating mechanical ventilation, as there may be dislodgement of the pacemaker leads by positive pressure ventilation or nitrous oxide entrapment in the pacemaker pocket. Perioperative considerations with regard to the use of cautery in a patient on pacing have to be kept in mind. Drugs such as isoproterenol and atropine should be available. Careful monitoring of pulse, pulse oximetry and arterial pressure is necessary during electrocautery, as ECG monitoring can also be affected by interference. Recent improvements in rate-responsive pacemaker engineering have led to improvements in maximum heart rate, exercise tolerance, functional status, suppression of dysrhythmias and a sense of well-being in patients.

CONCLUSION

The factors which favored the good outcome of this high-risk patient, were preoperative assessment, optimized cardiac status, formulating the anaesthetic plans, postoperative monitoring, anticipating the complications. Hence, successful management of the case.

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