CASE REPORT

Teriparatide-induced atrial tachycardia

Jeffrey B Ziffra,¹ Brian Olshansky²¹Cardiology, Mercy Medical Center, Mason City, IA, United States²University of Iowa Hospitals, Cardiology, Iowa City, Iowa, USACorrespondence to
Dr Jeffrey B Ziffra Jr,
jeffziffra@gmail.com

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SUMMARY

We present the case of a patient who presented with worsening chest pain and tachycardia. We were able to monitor her remotely through her pacemaker. She had been started on the injectable medication teriparatide (Forteo) and since then she had an increase in her symptoms. She was found to have intermittent atrial tachycardia with 1:1 conduction and occasional atrioventricular block transiently, coinciding with her injection of teriparatide. This specific-associated arrhythmia has yet to be described.

BACKGROUND

Teriparatide, a parathyroid analogue, is the first Food and Drug Administration (FDA)-approved treatment of osteoporosis. Although side effects are rare, arrhythmias have been reported to occur in 2% of patients, but no specific cardiac arrhythmia has been identified. This is the first reported case of symptomatic atrial tachycardia related to teriparatide use.

CASE PRESENTATION

A 77-year-old female with prior pacemaker implantation for bradycardia was placed on teriparatide (Forteo) for osteoporosis. For the last 2 months, she experienced substernal chest pain and palpitations almost immediately after teriparatide injection. The symptoms resolved within 5–10 minutes with ambulation but persisted longer at rest. She was found on pacemaker interrogation to have intermittent atrial tachycardia with 1:1 conduction and occasional atrioventricular (AV) block (figure 1). Her previous device interrogations did not demonstrate as prolonged and frequent episodes of atrial tachycardia (figure 2).

INVESTIGATIONS

The patient's pacemaker device was interrogated, which revealed intermittent atrial tachycardia with 1:1 conduction and occasional AV block occurring at 10 minute increments weekly, occurring shortly after the injection of teriparatide. Her other medications included taking losartan, dabigatran and metoprolol succinate. She was not on any other arrhythmogenic medications such as digoxin. Her most recent echocardiogram revealed normal left ventricular function and mild left atrial enlargement.

DIFFERENTIAL DIAGNOSIS

Cardiac arrhythmias including sinus arrhythmia, atrial fibrillation, premature ventricular or atrial complexes.

TREATMENT

The medication teriparatide was discontinued.

OUTCOME AND FOLLOW-UP

Per recommendation of her electrophysiologist and primary care physician, the patient stopped taking her teriparatide. The patient was found to have a profound decrease in symptoms on follow-up. There was a significant decrease in frequency and duration of atrial tachycardia as was seen with the use of teriparatide during follow-up appointments 1 and 3 months after her initial presentation.

DISCUSSION

Teriparatide, a parathyroid analogue, is the first FDA-approved treatment of osteoporosis. It is a portion of the human parathyroid hormone, which acts on the kidneys and bone to regulate calcium and phosphate metabolism. The result is increased bony turnover and increased bone mineral density. Injection of this medication causes a transient increase in serum calcium concentration maximally

Figure 1 Pacemaker strip displaying atrial tachycardia with 1:1 conduction shortly after injecting Forteo.

Figure 2 Pacemaker strip before Forteo use demonstrating a short brief run of atrial tachycardia.

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between 4 hours and 6 hours.¹ The most common side effects include headaches, arthralgia, pain and nausea.² Cardiac manifestations are rare and proposed to be due to changes in calcium metabolism.

Despite interacting with calcium, teriparatide is approved for use in patients with congestive heart failure. There have not been significant haemodynamic alterations described by its use.³ Specific ECG changes described with teriparatide include a decrease in RR intervals and heart rate corrected QT intervals.⁴ Arrhythmias have been reported to occur in 2% of patients, but no specific cardiac arrhythmia has been identified.¹ Atrial tachycardias often occur

from specific foci within the atrium but may also be caused by certain medications such as digoxin, albuterol and theophylline. Atrial tachycardia may also be associated with the use of caffeine or cocaine. Although our patient had developed structural heart changes that may be a substrate for arrhythmia, the use of teriparatide coincided with a significant increase in incidence of atrial tachycardia. This is the first case of symptomatic atrial tachycardia documented to be related to with teriparatide use.

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Patient's perspective

The patient has since stopped taking teriparatide per recommendation of her cardiologist and her primary care physician with almost complete resolution of her symptoms. She is considering doing a different time of parathyroid analogue. She alerted her primary care provider about the side effect and wanted to make others aware about this side effect.

Learning points

- ▶ Teriparatide, a parathyroid analogue used in osteoporosis, is relatively safe to use in cardiology patients.
- ▶ Side effects are rare but include cardiac arrhythmias in 2% of patients.
- ▶ We detected atrial tachycardia with 1:1 conduction and occasional atrioventricular block. This has yet to be reported in relation to teriparatide.

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