Ventricular tachycardia with long QT interval following consumption of ginseng - a case report

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ABSTRACT

Background: Ginseng has been used as a traditional medicinal herb for thousands of years. It is used for the treatment of various ailments, including gastrointestinal disturbances, metabolic disorders like diabetes mellitus, and even cancer. However, indiscriminate use can lead to serious cardiac emergencies, as observed in a case of life-threatening ventricular tachycardia that developed after consuming ginseng for several days.

Case Presentation: A 38-year-old woman was admitted to the emergency department with sudden-onset palpitations and recurrent episodes of syncope. On arrival, her electrocardiogram (ECG) indicated an irregular rhythm marked by premature ventricular complexes that escalated into pulseless ventricular tachycardia (VT), necessitating defibrillation. Subsequent ECG revealed a significantly prolonged QT interval. Treatment was initiated with intravenous magnesium and potassium (serum potassium 3 mmol/l), along with an oral beta-blocker (Metoprolol succinate 25 mg once daily). These interventions successfully prevented further VT episodes. It was later revealed that she had been taking ginseng regularly for the treatment of hemorrhoids.

Conclusion: The consumption of ginseng can have potentially life-threatening consequences. Raising awareness about the potential adverse effects of indiscriminate use is crucial. Medical professionals should enquire about the use of herbal supplements in patients presenting with unexplained cardiac arrhythmias.

Keywords: Case report, ginseng, herbal medicine, ventricular tachycardia, hypokalemia, long QT interval, cardiac arrhythmia.

Type of Article: CASE REPORT **Specialty:** Cardiology

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Introduction

Ginseng has been revered as a traditional medicinal herb in Asia for millennia, with its discovery reportedly dating back 5,000 years in the mountains of Manchuria [1]. The active components, known as ginsenosides, are triterpenoid glycosides (saponins) [2] that exhibit antioxidant and neuromodulatory properties. These compounds are credited with health benefits across a broad spectrum of conditions, from metabolic syndrome [3] to cancer treatment [4]. However, misuse of ginseng can lead to adverse effects, including potentially life-threatening unstable arrhythmias. While these risks are rare when ginseng is used at recommended dosages, they likely pose a threat in regions where its consumption is random and excessive. This case report highlights an instance of ventricular tachycardia with a prolonged QT interval in a woman who regularly consumed raw ginseng root.

Case Presentation

A 38-year-old woman from a rural village arrived at the emergency department (ED) with acute palpitations, presyncopal symptoms, and extreme fatigue. During the 56-kilometre journey to the hospital, she lost consciousness twice, recovering fully between episodes. Upon arrival, her electrocardiogram (ECG) revealed a short polymorphic ventricular tachycardia (VT) run followed by premature ventricular complexes of varying morphology (Figure 1).

She was promptly transferred to the intensive cardiac care unit, and while being assessed, she developed a sustained pulseless monomorphic VT with altered sensorium. A 200J direct current shock promptly restored sinus rhythm, and the subsequent ECG indicated a significantly prolonged QT interval (QTc—560 to 580 ms, Bazett formula) (Figure 2). An intravenous magnesium sulfate injection (2 g) was administered at this stage.

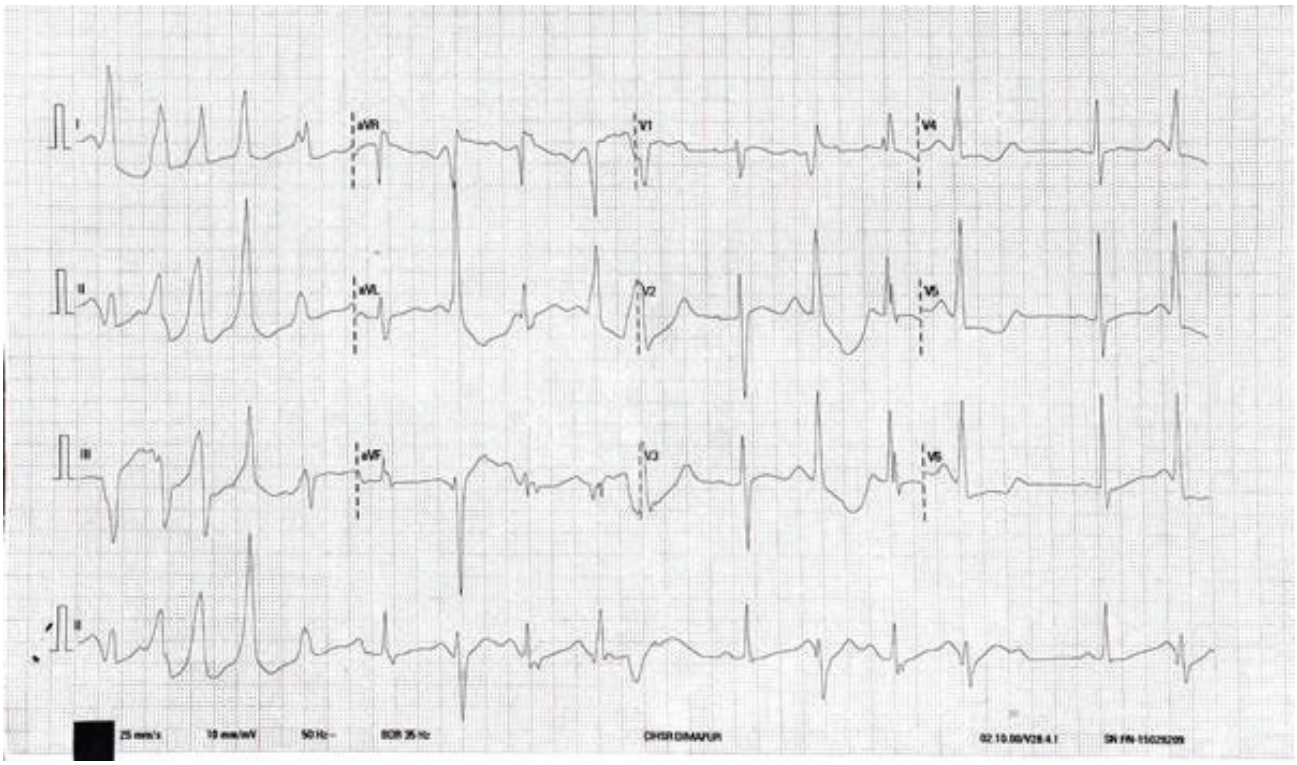

Figure 1. *Polymorphic VT with varying morphology VPCs at the time of presentation to the emergency department.*

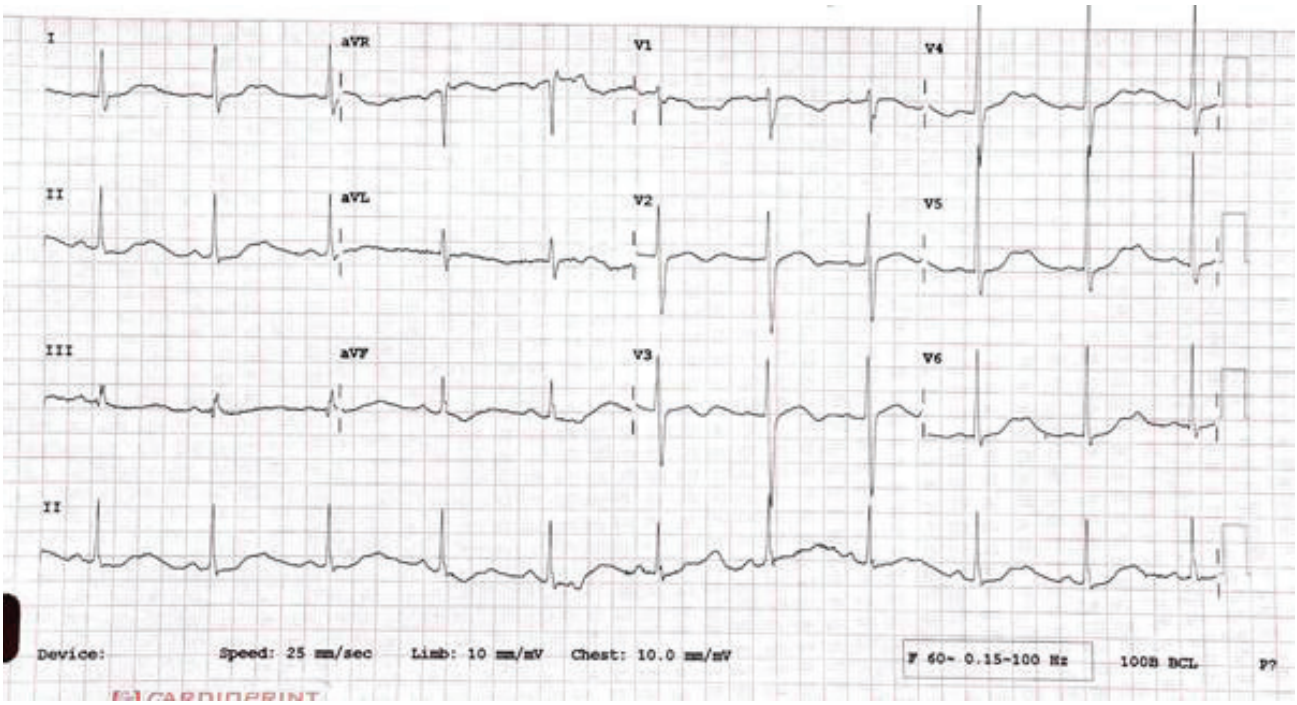

Figure 2. *Markedly prolonged QT interval (QTc—560 to 580 ms, Bazett formula) recorded on the ECG that was taken soon after cardioversion of VT.*

Blood tests revealed a serum potassium level of 3 mmol/l, while all other parameters, including arterial blood gases, were normal. Intravenous potassium correction was initiated, and a beta blocker (Metoprolol succinate 25 mg once daily) was added to her treatment plan. With these measures, there was no recurrence of VT. A bedside echocardiogram revealed a structurally normal heart. She had an uneventful recovery, and by the third day, her QT interval had normalized to a corrected QT of 436 ms (Figure 3).

The patient disclosed that she had been consuming a crushed ginseng root (Figure 4) mixture with water

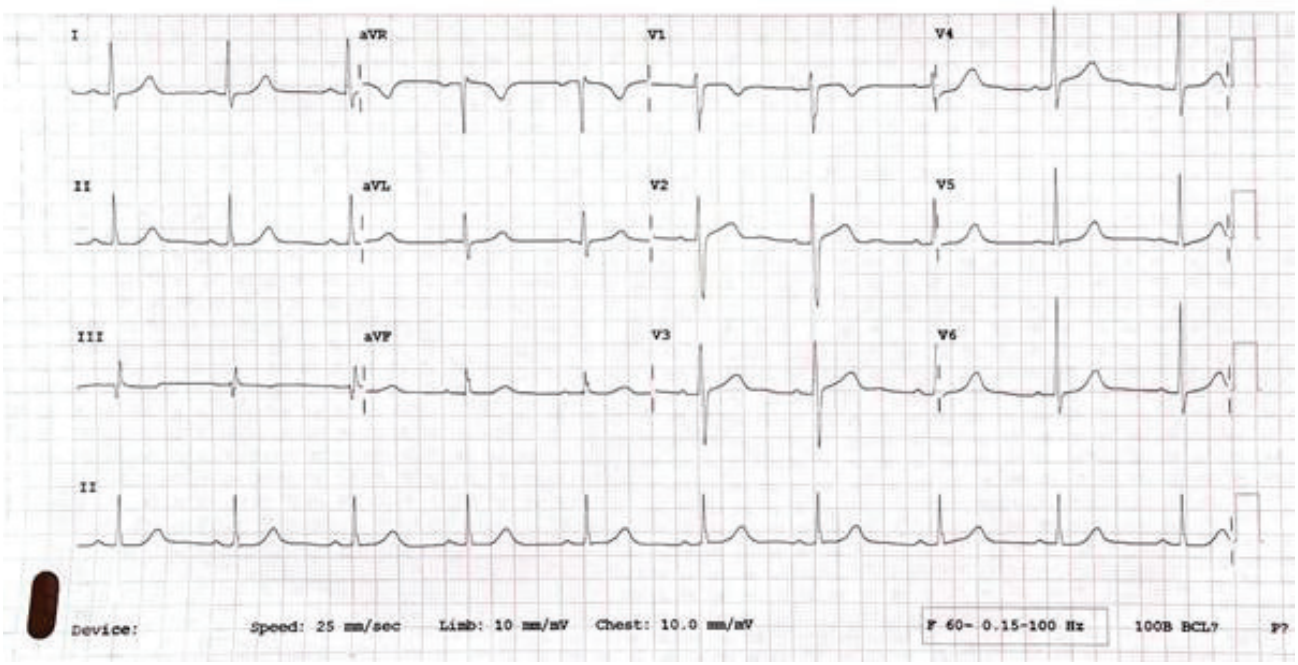

Figure 3. *Normal QT interval on day 3 of admission (QTc - 436 ms).*

Figure 4. *Dried Ginseng root consumed by the patient.*

twice a day as a traditional remedy for hemorrhoids. She had been doing this intermittently for 2 months, but recently increased her intake to larger quantities (5-8 g of raw dried ginseng root daily). She was on absolute fasting (abstaining from both solid and liquid food intake) for 2 days before the cardiac emergency occurred, during which she continued to take the ginseng mixture. She is a mother of three and reported no significant family or past medical history. She was not on any other medication, and there was no history to suggest substance abuse.

Discussion

Although ginseng is a well-known medicinal herb, there have been reports of potentially serious cardiac adverse effects. A woman developed long QT with torsades de pointes after consuming ginseng daily for over 6 months [5]. Such adverse reactions are likely rare and considered idiosyncratic. Nonetheless, the effect of ginseng on the QT interval has been demonstrated in a randomized prospective study, where participants taking ginseng extracts for 28 days exhibited a significant prolongation of the QTc compared to the placebo group [6].

In a study involving animal subjects, the infusion of Rg1 ginsenosides (the bioactive component of ginseng) resulted in the prolongation of the ventricular effective refractory period [7]. Another bioactive component of ginseng, ginsenoside Re, has been shown to suppress the rapid component of the delayed rectifier potassium current (IKr) [8]. This current is crucial for repolarization of the heart muscle cells, and blocking IKr can prolong the ventricular action potential duration, causing delayed repolarization and a prolonged QT interval [9].

The patient also had a low serum potassium level of 3 mmol/l (Normal reference range 3.5 - 5 mmol/l). It is unclear if ginseng directly contributes to hypokalemia, and hence, the association between ginseng intake and reduced potassium levels remains speculative.

Dyselectrolytemia and prolonged QTc during fasting is a well-documented phenomenon [10,11]. In addition to reduced intake during fasting, there is rapid potassium loss through renal excretion [12]. The Volume loss associated with fasting triggers the secretion of aldosterone, which stimulates the reabsorption of sodium and the excretion of potassium, leading to hypokalemia. In addition, metabolic alkalosis observed during fasting leads to bicarbonate diuresis and loss of accompanying potassium ions in the urine [13]. Even though the duration of fasting in this particular case is short (2 days), the possibility that this was a contributing factor to the cardiac arrhythmia cannot be ignored.

Panax pseudoginseng is native to India and is particularly abundant in the Northeast. Despite its presence in various parts of the region, its survival is threatened by overexploitation for medicinal use [14]—chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ijcs.ro/public/IJCS-16-61_Jamir.pdf

Conclusion

Given the widespread use of ginseng, there is a risk of inadvertent misuse leading to potentially life-threatening adverse effects. Clinicians should actively inquire about herbal supplement use in patients with unexplained arrhythmias or QT prolongation. It is also essential to disseminate information about such adverse effects to the public.

What is new

Indiscriminate use of traditional medicinal herbs like ginseng can lead to serious and life-threatening cardiac arrhythmias.

List of Abbreviations

ECG	Electrocardiogram
ED	Emergency department
PVC	Premature ventricular complexes
VT	Ventricular tachycardia

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

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Consent for publication

Due permission was obtained from the patient to publish the case and the accompanying images.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

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Summary of the case

1	Patient (gender, age)	17, male
2	Final diagnosis	Osteopoikilosis in a patient with orthopedic trauma.
3	Symptoms	Proximal phalanx fracture with degloving of the index finger
4	Medications	Surgery
5	Clinical procedure	Surgery
6	Specialty	Traumatology and orthopedics