Statin-induced tendon rupture in a patient with high 10-year ASCVD score; a case report

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Abstract

We present 58-year-old man on long-term statin therapy with history of ischemic heart disease and percutaneous coronary intervention. Statin-associated tendon rupture is an uncommon clinical presentation that happened in our case. We review the literature to find the reliable substitute of statin in such high-risk patients for atherosclerotic cardiovascular disease.

Introduction

The 3-Hydroxy-3-Methylglutaryl Coenzyme A (HMG-CoA) reductase inhibitors or statins are widely used in the primary and secondary prevention of cardiovascular events (1).

Statins are usually well-tolerated and do not have many serious side effects. One of the side effects that can affect the decision to continue treatment with statins is musculoskeletal complications such as tendinopathy, which is most common with Atorvastatin and Simvastatin (2).

Statin-related musculoskeletal adverse effects (AE) vary from mild myalgia and muscle weakness to tendinopathy and rhabdomyolysis (1). The probable risk factors summarized in table 1. Tendinopathy is usually presented with tendinitis and tendon rupture, especially of the Achilles, quadriceps, and distal biceps tendons, which mostly happen within the first year of initiation and improve after discontinuation (3).

In this case report, we described a 58-years old man who experience tendon rupture as an adverse effect of using statin.

Case Report

A 58-years old man, a Municipal employee with athletic experience presented with two tendon ruptures in the rotator cuff tendon in different shoulders after two minor traumas.

He had a history of ischemic heart disease and went under percutaneous coronary intervention (PCI) procedure (4 years ago), 10 year-ASCVD risks score 22.7%, benign prostate hypertrophy, hypertension and diabetes mellitus. He has been prescribed 40mg Atorvastatin once a day, 0.4mg Tamsulosin once daily, 5mg

Amlodipine once daily, Dutasteride 0.5mg once a day, Metoprolol 12.5mg every 12 hours, Metformin 500 mg every 8 hours, Pioglitazone 15mg every day, and ASA 80mg once a day. The patient has no history of alcohol or smoking. He has a familial history of hypertension and heart disease.

Before these accidents, the patient remembers having aches in both his shoulders after playing sports, like soccer which he did not experience before. The first trauma occurred in 2020 when the patient was climbing a gentle slope mountain. He slipped on his left hand and suffered pain at that moment but it was light enough for him to be neglected, and he didn't seek medical advice. He also mentions that similar accidents had happened before, too but he got better in a little time. After some time (he can't recall specifically), the patient had the same falling accident while participating in an indoor soccer match. It caused too much pain in his shoulder that made the patient visit a doctor. The pain was intense and he had difficulty raising his hand.

MRI (figure 1) ordered for him. Full-thickness tearing seen at the critical zone of the supraspinatus tendon. It was related to this minor trauma. That was why the doctor performs surgery on him and did not change his drugs. also partial tearing in right rotator cuff tendon was present at that time but it was not diagnosed and no action was taken against it. After two years he slipped on his right hand which caused the same pain that he experienced two years before.it was intense, non-radiating pain that worsened at night and especially when he abducted his hand. He visited a doctor again and was ordered to do an MRI (figure 2). The evidence of complete tearing in the rotator cuff tendon was seen besides joint effusion. So he went under Arthroscopic tendon repair procedure for the second time.

After these two minor traumas, suspicion was raised about atorvastatin side effects to be the real cause.

The Naranjo adverse drug reaction (ADR) probability scale was calculated, and the patient achieved a score of 7, which means tendon rupture probably happened due to atorvastatin.

Additional investigation was done which was normal.

Finally, due to the recurrent tendon rupture and Naranjo scale score, Atorvastatin was considered as the causative agent and it was discontinued.

As for the high score of 10 year-ASCVD risks, it was necessary to prescribe an alternative drug with mortality-reducing effects in cardiovascular patients, as same as statins. After enough studies, Evolocumab 140mg once in two weeks, was selected as an alternative from the family of PCSK9 inhibitors.

Discussion

The clinical effects of statins in reducing mortality in patients with a history of cardiovascular events are related to their pleiotropic effects (4); which means in addition to the cholesterol-lowering effect, they have extra effects which are responsible for clinical benefits in patients with CVD. These effects include increasing myocardial perfusion and reducing recurrent anginal episodes after acute chronic events by modulation of endothelial function, plaque stabilization, neovascularization, attenuated atherogenesis, neurohormonal imbalance improvement, decreasing oxidative stress, vascular inflammation, and antithrombotic action (1,4).

Proposing an alternative drug in patients who require receiving secondary prophylaxis for cardiovascular events considered a serious challenge, especially in case of side effects such as recurrent tendinopathy, which requires statin discontinuation.

Proprotein convertase subtilisin/Kexin type 9 (PCSK9) inhibitors are one of the hypolipidemic classes that have Food and Drug Administration (FDA) approval for treatment of autosomal familial hypercholesterolemia. Evolocumab, Alirocumab, and Cocizumab are well-known PCSK9 inhibitors. Their main mechanism of action is to increase LDL receptors on hepatocytes by inhibiting PCSK9, which is responsible for the inhibition of LDL-receptor (5).

The pleiotropic effects of this family, beyond the lipid-lowering effects, include inhibition of atherogenesis, stabilization of atherosclerotic plaque, anti-inflammatory effects by increasing the concentration of interleukin

10 (IL-10) and decreasing the concentration of interleukin-1a (IL-1a), interleukin-6 (IL-6) and tumor necrosis factor a (TNF-a), anti-aggregation and anticoagulant effect (5).

Due to their effects in reducing cardiovascular events and all-cause mortality in very high-risk atherosclerotic cardiovascular disease (ASCVD) patients (5–7), they can be considered as a suitable alternative in patients with statin intolerance.

Conflict of Interest Statement

No conflict of interest has been declared.

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Supplementary

Table 1. Major risk factors of statin-induced musculoskeletal injury

Age>80 y/o
Female sex
Diabetes mellitus
Chronic kidney disease
Acute or chronic liver disease
Hypo**thyroidism**
Recent major trauma or surgery
Drug interactions (ie. Fibrates, calcium channel blockers, amiodarone, pioglitazone and rosiglitazone, azole antifungals, prot

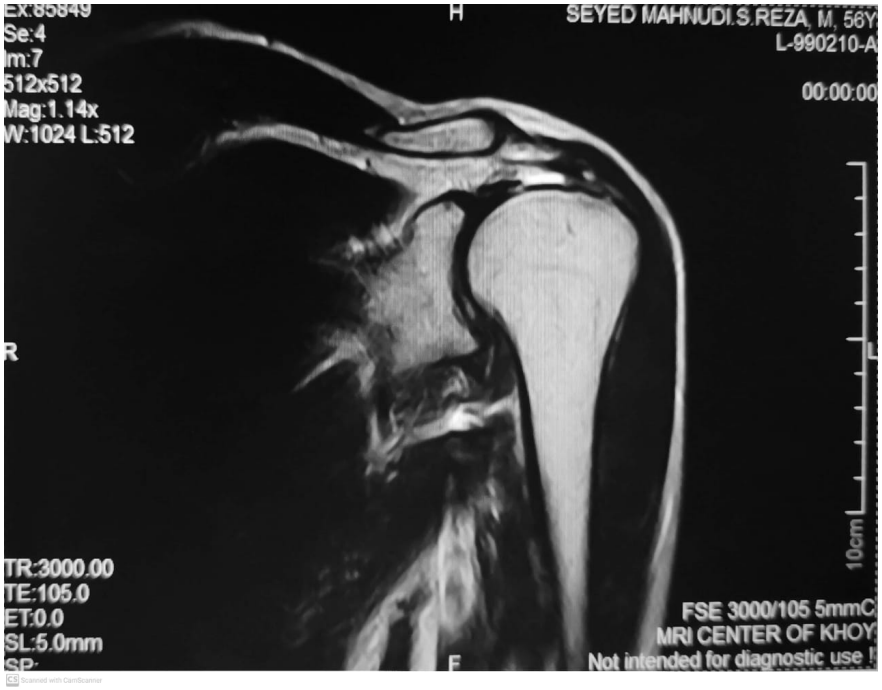
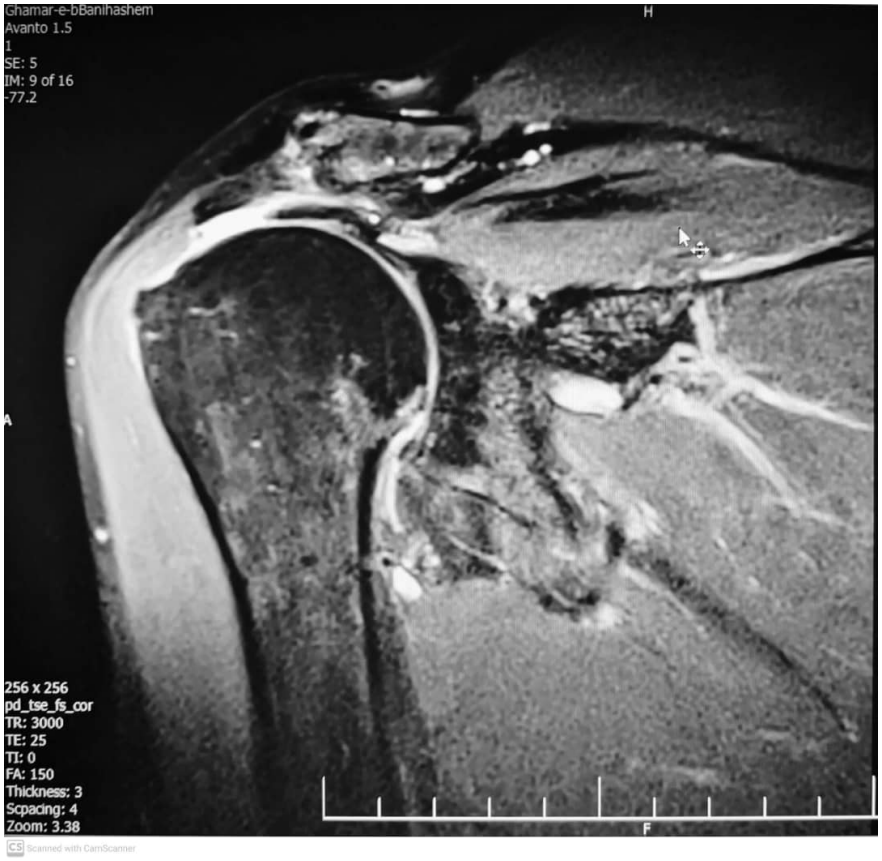


FIGURE 1. Full thickness tearing seen at critical zone of supraspinatus tendon

FIGURE 2. Complete tearing in the rotator cuff tendon



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