

Rehabilitation after endoscopically percutaneous intramuscular splintage for vastus medialis partial rupture - A case report and review of the literature

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Summary

Isolated rupture of the vastus medialis muscle is rare, and surgical repair is recommended. The results of rehabilitation programme after the percutaneous intramuscular splintage of a nearly total vastus medialis muscle tear in a 52-year professional-master degree weight-lifter is presented in this report.

Key words: vastus medialis, muscle tear, percutaneous intramuscular splintage, sports-specific rehabilitation.

Figure 1. View of the knee extensor mechanism of the patient.



Pre-operative.

Case Report

Vastus medialis muscle of a 52-year-old male professional weight-lifter (master degree) was ruptured during training. After 3 days, he (HG.,D. Height: 179 cm, Weight: 98 kg) was admitted to sports medicine clinic with oedema, pain, and swelling on the medial side of his right knee (dominant side). After the physical examination and MRI assessment, nearly total vastus medialis rupture was detected and surgical intervention was planned (Fig. 1). In March 2011, ruptured vastus medialis muscle was treated endoscopically with percutaneous intramuscular splintage technique. Following surgery, patient underwent intensive sports-specific physiotherapy programme (Tab. 1).

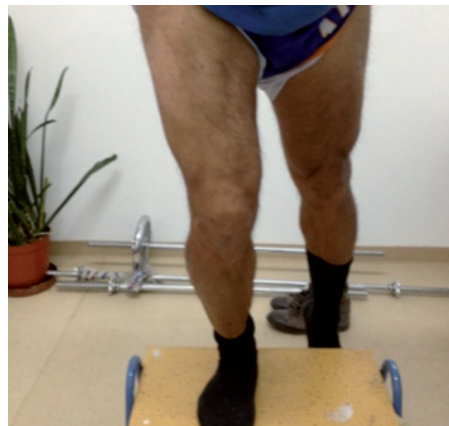
After a year, quadriceps and hamstring isokinetic muscle strength (at 60°/s, 180°/s) using Biodex ® 3 and one-leg hop test were evaluated. There were no significant differences in muscle strength and hop length between the legs (Tab. 2). There was no palpable nor visible gap on the vastus medialis of the right knee. There was no pain, swelling nor oedema on/around the surgical area and right knee.

Based on results, patient's returning to competition was approved. In June 2012, he was the winner European Master Weight-lifting Championship.

Discussion

Although quadriceps muscle strains are common injuries among young athletes, isolated vastus medialis muscle is rare and there is no article published to date.

Risk factors and injury mechanisms of the muscle



A year after the surgery.

Table 1. Physiotherapy Programme.

Brace:	1 st week: 0° - 30°
	2 nd week: 0° - 60°
	3 rd week: 0° - 90°
	4 th - 6 th weeks: 0° - 120°
Exercises:	1 st - 3 rd weeks: Quadriceps isometric (towel under the heel) Straight leg raises (with weights) Closed chain knee exercises
	3 rd - 6 th weeks: Weight bearing exercises such as wall squat, squat on the mat/swissball Three angles quadriceps isometric exercises Terminal quadriceps: Short-arc 0° - 30° knee extension Quadriceps isotonic (with weights)
	6 th - 12 th weeks: Running, Hopping Weight training for power Weight training for endurance Squat with weights Eccentric exercises during the step-down and up
	After the 3 months: Sports-specific programme Split squat with the front foot on a wobble board Single arm dumbbell bench press/shoulder press from a fit ball Sprint arm action with dumbbells Lunges/step-up drives

Table 2. Results.

		Right Side (Operated/Dominant)		Left Side (Non-dominant side)	
		Quadriceps	Hamstring	Quadriceps	Hamstring
Isokinetic	60°/s	175	124	124	97
Strength (Nm)	180°/s	79	84	61	76
Hop test (cm)		135		152.33	

tears/injuries are generally common in sports, accounting for about 35-45% of all injuries¹. The rate of the muscle injury and tear increases in sports which product of high loading and eccentric forces^{2,3}.

Treatment approaches for the professional athletes should be focused to accelerate recovery from muscle injuries and protect re-injury/recurrence tear. Nowadays, restoration of muscle function after muscle tear is provided using surgical approaches. Although inadequate evidence-based trials are in the literature, injection therapies such as platelet-rich plasma (PRP) therapies should be option to help professional athletes⁴. There is only one clinical trial on PRP therapies for the muscle injuries in recreational athletes and this clinical study contained important methodological limitations⁵. In the literature, there is no consensus about techniques and results of the PRP therapies for the muscle injuries and tears.

In the literature, there are no published results about the prognosis after operative treatment of the isolated vastus medialis muscle tears. To knowledge, it is the first study to investigate effects of the specific rehabilitation programme after the percutaneous intramuscular splintage of a nearly total vastus medialis muscle tear.

The healing of the ruptured muscle is slow and fibrosis,

degeneration, and inadequate functional recovery may be developed⁶. Immediate repair of quadriceps tendon ruptures is a common and accepted treatment strategy to re-establish and improve the function of the extensor mechanism of the knee⁶. Delayed surgery may cause scar tissue formation, excising of this tissue should be needed⁷. Surgical treatment was performed to prevent scar tissue formation, lack of the functionality and strength in the present case.

After the repair of the tear using endoscopically percutaneous intramuscular splintage technique, specific rehabilitation programme was performed. He returned to sport safely as a pre-injury level. We believe that surgery and specific rehabilitation programme for vastus medialis muscle tear should provide fast and proper returning to sport for professionals.

Conclusion

In the absence of evidence-based studies about PRP therapies and surgical approaches for the isolated vastus medialis, surgical treatment and sports-specific rehabilitation programme was chosen to accelerate healing

process and return to sport for professional athlete in this study. The studies are needed to determine the effects of the alternative therapies and surgical approaches for muscle tear of the isolated vastus medialis.

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