CASE REPORT

Femoral nerve paralysis complicating a post-traumatic iliopsoas haematoma

Mouadh Nefiss, Anis Tebourbi, Aymen Ben Maatoug, Ramzi Bouzidi

Department Of Orthopedic Surgery, Tunis El Manar University, Faculty Of Medicine, Tunis, Tunisia

Correspondence to

Dr Mouadh Nefiss, mouadhnefiss2@gmail.com

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SUMMARY

Paralysis of the femoral nerve secondary to iliopsoas haematoma is a rare post-traumatic complication. Because of the large differential diagnosis, a high level of suspicion is required for its early recognition. Treatment modalities are controversial due to the rarity of this entity. An 18-year-old student presented with complete paralysis of the knee extensors and a sensory deficit on the anterior side of the thigh 5 weeks after a sport accident. MRI of the lesser pelvis showed an iliopsoas haematoma. Surgical decompression was performed and recovery was complete at 6 months of follow-up.

BACKGROUND

Paralysis of the femoral nerve secondary to an iliopsoas haematoma is widely reported in patients with blood coagulation disorders^{1 2} and those on anticoagulant treatment.^{3 4} However, post-traumatic aetiology is rare, with only 38 cases reported in the literature (table 1).

Management of these cases is still controversial, and there is no large series of patients from which to base treatment decisions.^{5–7} We present a case of femoral nerve palsy secondary to post-traumatic iliopsoas haematoma that resolved by operative management in an adolescent. We review the current literature available on this subject.

CASE PRESENTATION

A healthy 18-year-old man in the terminal class of a secondary school fell down while preparing for a gymnastic exam. He described a fall on the lower left limb, causing pain in the groin area. He was unable to walk, which made him consult the emergency, where he received symptomatic drug, including non-steroidal anti-inflammatory drug. The pain became worse the following days and was associated with numbness and weakness of the

Figure 2 Mass on the left iliac fossa.

left thigh. This paralysis was incomplete after injury, and progressed to complete paralysis later. He was admitted to our hospital 5 weeks after the injury.

On examination, he was not able to walk without support. A soft, tender mass was palpable on the left iliac fossa and the groin (figures 1 and 2). The thigh girth was 2 cm smaller on the left side than on the healthy side. The results of manual muscle testing of the left lower limb were 1 for the hip flexor and 0 for the knee extensors. Patellar tendon reflex was absent. Skin sensation was absent in the anterior aspect of the left thigh.

INVESTIGATIONS

Plain radiographs of the pelvis were normal. Blood tests (coagulation time, prothrombin time and platelet count) did not show any abnormalities. An MRI revealed a haematoma of the iliacus muscle measuring 93×63×60 mm. The signal intensity in the mass varies from low to high on both T1-weighted and T2-weighted images (figure 3).

Complete paralysis of the femoral nerve resulting from the post-traumatic iliacus muscle haematoma was confirmed.

TREATMENT

Surgical evacuation of the haematoma was carried out under general anaesthesia (figure 4).

OUTCOME AND FOLLOW-UP

The postoperative course was uneventful. The quadriceps muscle power returned to fair at 3 months and to normal at 6 months (figure 5, video 1).

DISCUSSION

Paralysis of the femoral nerve due to compression by a haematoma of the iliopsoas in the lesser pelvis is a well-known complication in patients receiving anticoagulants (the incidence ranges from 1.3% to

Figure 1 Amyotrophy of the left quadriceps.

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Table 1 Reported cases of femoral nerve paralysis secondary to traumatic iliopsoas haematoma

Author	Year	Age/Sex	Interval from injury to diagnosis (days)	Quadriceps paralysis	Surgery	Neurological recovery
Tallroth ¹⁵	1940	16/M	10	Complete	Yes	Complete
Strandell ¹⁶	1942	18/M	9	Incomplete	Yes	Incomplete
		19/M	18	Complete	Yes	Complete
Negishi ¹⁷	1966	16/M	19	Incomplete	No	Incomplete
Green ¹⁸	1972	16/F	6	Complete	Yes	Complete
Kunimatsu <i>et al</i> ¹⁹	1976	16/F	1	Incomplete	No	Complete
Kataoka ²⁰	1976	17/F	25	Complete	Yes	Incomplete
Ramirez <i>et al</i> ²¹	1983	18/M	30	Complete	Yes	Complete
Tanabe <i>et al</i> ²²	1984	13/M	24	Incomplete	Yes	Complete
		14/M	25	Incomplete	Yes	Complete
Endo <i>et al</i> ²³	1988	14/M	0	Incomplete	No	Complete
		32/M	2	Incomplete	No	Incomplete
Takemasa <i>et al</i> ²⁴	1988	18/M	0	Complete	Yes	Complete
Suzuki <i>et al</i> ²⁵	1988	18/F	2	Incomplete	Yes	Complete
Ogawa <i>et al</i> ²⁶	1990	42/M	60	Complete	Yes	Incomplete
Berlusconi and Capitani ²⁷	1991	M	Not known	Incomplete	No	Complete
Kohno <i>et al</i> ²⁸	1992	16/M	4	Incomplete	Yes	Complete
		14/M	7	Incomplete	Yes	Complete
Rochman <i>et al</i> ¹⁴	2005	20/M	7	Incomplete	Yes	Complete
Na <i>et al</i> ²⁹	2012	17/M	15	Incomplete	Yes	Complete
Sallahi <i>et al</i> ³⁰	2015	14/M	90	Complete	Yes	Incomplete
Lefevre <i>et al</i> ⁶ systematic review: 16 patients	2015	Mean age: 16.6 11 M, 5 F	2 days to 6 weeks	Complete: 8/16 Incomplete: 8/16	Yes: 9/16 No: 7/16	Complete: 13/14 Incomplete: 1/14 Not reported: 2
Total	75 years	Mean age: 17.6 Sex ratio: 29 M:9 F	Mean: 16.7 days	Complete: 14/38 Incomplete: 24/38	Yes: 25/38 No: 13/38	Complete: 28/36 Incomplete: 8/36 Not reported: 2

F, female; M, male.

6.6%) and haemophiliacs (the incidence ranges from 5.5% to 10.4%).^{7–9} This entity has also been described after hip surgery and surgery of the lesser pelvis.¹⁰ However, traumatic aetiology has not been reported widely in the literature. All published reports occurred in young patients (12–24 years old), and the common mechanism of injury is a sport accident (table 1).

Aetiopathogenesis hypothesis reported that the femoral nerve follows a pathway between the tendon of the psoas and the iliacus muscle, then passes under the iliac fascia, which is thick and not easily deformed. As a result, the femoral nerve is compressed along the iliopsoas groove and is then paralysed. This has been investigated experimentally by infusion of fluid or latex injection into the iliacus sheath.^{7 11 12}

Figure 3 MRI of the pelvis before surgery. The signal intensity in the mass varies greatly, ranging from low to high. (A) Coronal and (B) axial images showing haematoma enveloping the femoral neurovascular bundle.

Figure 4 Evacuation of the haematoma.

Figure 5 Examination at 3 months.

electromyography exam, and a diagnosis of compressive iliopsoas haematoma is confirmed by CT scan or MRI.⁵

The differential diagnosis for this syndrome is large, and early recognition requires a high level of suspicion.⁶ It can mimic a simple muscular strain, and if treated with non-steroidal

Video 1 Examination at 3 months.

anti-inflammatory drugs can lead to progression of the haematoma. The delay between the injury and the diagnosis varies from 2 days to 6 weeks.⁵

There is no large series of patients from which to base treatment decisions and modalities. The progressive nature of the neuropathy and anatomical studies showing a gradual increase of internal pressure in the iliacus compartment raise a question as to the method of treatment and its timing.¹³ Traditionally, non-operative treatment has been recommended in patients with blood dyscrasia and surgical decompression for cases of iliacus haematoma resulting from trauma.⁶ An alternative to open surgical treatment is percutaneous decompression. This treatment can be used only for liquid haematomas, and it would not be useful for patients whose diagnosis is delayed until they already have organised haematomas.^{7,14}

We recommend conservative treatment in case of early diagnosis and partial paralysis, with close monitoring and surgical treatments in case of later diagnosis, especially in the presence of complete paralysis. The prognosis after surgical decompression is not pessimistic even in patients with complete paralysis.

Learning points

- ▶ As the number of young adults participating in sport increases, it is important to include iliacus haematoma in the differential diagnosis of groin pain.
- ▶ Conservative management can be proposed under strict supervision of the neurological examination.
- ▶ In case of complete femoral nerve palsy, surgery is necessary regardless of the delay between injury and diagnosis.

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