내시경적 요추 감압술 후 큰 가성동맥류와 함께 나타난 요근 혈종에 의해 발생한 요추부 신경얼기병증: 증례 보고

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Psoas Hematoma with a Large Pseudoaneurysm Causing Lumbar Plexopathy after Endoscopic Lumbar Decompression: A Case Report

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We report a case of psoas hematoma with a large pseudoaneurysm causing lumbar plexopathy following endoscopic lumbar decompression. A 34-year-old man had received posterolateral endoscopic lumbar decompression for the treatment of herniated intervertebral disc at L4/S level. After endoscopic lumbar decompression, his low back pain, groin pain and motor weakness of his left lower extremity were more aggravated. Psoas hematoma with a pseudoaneurysm causing lumbar plexopathy was detected by computed tomography scan and confirmed by electrodiagnostic testing. In order to prevent permanent and catastrophic disability, a proper evaluation for detecting possible complication and immediate management should be needed during the early post-operative phase.

Keywords: Hematoma, Lumbar plexopathy, Pseudoaneurysm, Endoscopic lumbar decompression

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Introduction

Iliacus hematoma is a rare cause of femoral neuropathy [1]. Hematoma in the psoas muscle is also rare cause of lumbar plexopathy [2]. In patient with anticoagulation therapy or hemophilia, spontaneous hematoma on retroperitoneal space can be occurred occasionally [3,4]. However, in patient without bleeding

tendency, psoas hematoma causing lumbar plexopathy developed after surgery has been known as a much rarer phenomenon [5,6]. Though there is no consensus for the treatment of lumbar plexopathy from psoas hematoma, delayed diagnosis or treatment can lead to severe and permanent disability.

We report a unique case of psoas hematoma with a large pseudoaneurysm causing complete lumbar plexopathy after postero-

lateral endoscopic lumbar decompression, which was confirmed by computed tomography (CT) and electrodiagnostic testing.

Case report

A 34-year-old man first visited our outpatient clinic with low back pain, severe radiating pain and weakness of left lower extremity and groin pain (Numeric rating scale, NRS 9/10). He had no past history of chronic medical disease, such as hypertension and diabetes. He said his intermittent low back pain had begun about 3 years ago, however, 2 months earlier, radiating pain to left lower extremity was newly developed. Therefore, 3 weeks ago, he had received posterolateral endoscopic lumbar decompression on left lumbar 4/5 level at the local spine clinic under diagnosis of herniated intervertebral disc at lumbar 4/5 level with left radiculopathy. Unexpectedly, his low back pain and radiating pain to left lower extremity was not improved but more aggravated and weakness of left lower extremity was newly developed after endoscopic surgery. About 1 week after endoscopic decompression, proximal weakness of left lower extremity was newly detected.

On physical examination, according to the medical research council (MRC) grading system, the motor strength of left hip flexor, hip extensor, knee flexor, knee extensor, ankle dorsiflexor and ankle plantar flexor was 1, 3, 3, 0, 3 and 4, respectively. There were decreased sensation on L2 ~ L5 dermatome of left lower extremity and a diminished knee jerk reflex. Above all, he complained left lower extremity and groin pain (NRS 9/10). Abdomen and pelvic CT revealed a huge hematoma in left psoas muscle with a large pseudoaneurysm at posterior aspect of the hematoma (Fig. 1). According to CT findings, emergent embolization at proximal and distal portion of pseudoaneurysm of left 4th lumbar artery was done by the intervention specialist (Fig. 2).

His lower extremity pain was slightly improved after intervention. On next day after embolization, lumbar spine contrast-enhanced magnetic resonance imaging was done and revealed huge hematoma in the left psoas muscle encasing left L4 nerve root (Fig. 3). Six days after intervention, his pain was more improved, but weakness of his left lower extremity was not improved. From then, comprehensive rehabilitation for restoration of weakness and gait function was begun. Electrodiagnostic testing revealed left lumbar plexopathy with axonal degeneration, mainly femoral and obturator nerves involved, complete in nature (Tables 1, 2). Three months after endoscopic lumbar decompression, his motor weakness was persisted and atrophy of left quadriceps and adductor muscle was detected. Motor weakness of left knee extensor (grade 0/5) and hip flexor (grade 1/5) was not improved. Hypesthesia of his left anteromedial thigh was still existed.

Discussion

Iliopsoas hematoma often occurs in hemophilia patients, anti-

Fig. 2. (A) Pseudoaneurysm at 4th left lumbar artery. (B) 7 microcoil embolization was done at proximal and distal portion of pseudoaneurysm of left 4th lumbar artery.

Fig. 1. Abdomen and pelvic CT scan with contrast enhanced. Axial (A) and Coronal view (B). A huge hematoma in left psoas muscle with a large pseudoaneurysm at posterior aspect of the hematoma (arrows).

coagulant recipients, patient with arteriovenous malformations who undergo a low-energy trauma [2]. The mechanism for compression injury of lumbar plexus caused by such retroperitoneal hematoma has already been established [7]. In the case of hematoma at iliacus, the femoral nerve is often compressed. On the other hand, in psoas hematoma, the femoral and obturator nerves can be mainly co-compressed, resulting in diffuse lumbar plexus injury, although it is a rare complication [2]. Previous published three cases of complete lumbar plexus injury secondary to compression by a hematoma were mostly spontaneous he-

Fig. 3. Lumbar spine contrast-enhanced MRI T2 weighted image on next day after embolization revealed a huge hematoma in the left psoas muscle encasing left L4 nerve root (arrows).

Table 1. Nerve Conduction Study

Nerve and sites	Lat, ms	Amp, mV	CV, m/s
Motor conduction study			
Lt peroneal nerve (EDB)	4.00	3.2	43.5
Rt peroneal nerve (EDB)	4.25	2.9	47.2
Lt tibial nerve (AH)	3.73	20.7	45.0
Rt tibial nerve (AH)	3.57	28.9	45.7
Lt femoral nerve (RF)	-	-	NT
Rt femoral nerve (RF)	4.71	11.9	NT
Sensory conduction study			
Lt superficial peroneal nerve	2.29	12.5	43.7
Rt superficial peroneal nerve	1.84	18.8	54.3
Lt sural nerve	1.82	22.7	54.9
Rt sural nerve	1.85	25.9	54.1
Lt LFCN	-	-	-
Rt LFCN	2.49	11.0	72.3
Lt saphenous nerve	-	-	-
Rt saphenous nerve	2.54	4.7	55.1

Rt, right; Lt, left; EDB, extensor digitorum brevis; AH, abductor hallucis; RF, rectus femoris; Lat, latency; Amp, amplitude; CV, conduction velocity; LFCN, lateral femoral cutaneous nerve; NT, not tested.

matoma associated with bleeding tendency, such as in patients with hemophilia or other diseases (leukemia, disseminated intravascular coagulation) [2]. And it has also been reported lumbar plexopathy after lumbar plexus block for analgesia in hip surgery in patient treated with enoxaparin [8].

Not the spontaneous hematoma mentioned above, in case of an iatrogenic psoas hematoma without anticoagulant therapy, there were few cases reported. Two cases of iliacus hematoma causing femoral neuropathy associated with hip arthroplasty were previously reported [5,6]. Robinson et al. presented a case report of iliopsoas hematoma with femoral neuropathy after spinal decompression [9]. In this case, 8 weeks after a posterior, mid-line, spinal decompression, mild groin pain and a femoral neuropathy developed. After exploration, the compartment was fully decompressed with resolution of the nerve root symptoms within 48 hours. However, after endoscopic lumbar decompression, this is the first case of psoas hematoma presenting a large pseudoaneurysm causing lumbar plexopathy. In this case reported, psoas muscle hematoma with lumbar plexopathy following posterolateral endoscopic lumbar decompression might have been associated with the 4th lumbar artery. Lumbar arteries pass beneath the psoas and develop into posterior and spinal branches [9], in this case, a posterior branch may have been injured, leading to psoas hematoma with a large pseudoaneurysm. Therefore, if there was a groin pain and/or weakness of lower extremity was newly developed or aggravated after endoscopic lumbar decompression, the possibility of psoas hematoma caused by vessel

Table 2. Needle Electromyography

Muscle	Fib	PSW	Recruitment
Lt Adductor longus	2+	2+	0/5
Lt Adductor magnus	2+	2+	1/5
Lt Tibialis anterior	2+	2+	3/5
Lt Peroneus longus	2+	2+	4/5
Lt EHL	1+	1+	3/5
Lt Gastrocnemius	-	-	5/5
Lt Vastus medialis	2+	2+	0/5
Lt Iliopsoas	2+	2+	0/5
Lt Rectus femoris	3+	3+	0/5
Lt Sartorius	3+	3+	0/5
Lt Gluteus medius	-	-	4/5
Lt Gluteus maximus	-	-	4/5
Lt L3 paraspinalis	-	-	-
Lt L4 paraspinalis	2+	2+	-
Lt L5 paraspinalis	3+	3+	-
Lt S1 paraspinalis	-	-	-

Lt, left; Fib, fibrillation potential; PSW, positive sharp wave; EHL, Extensor hallucis longus; NT, not tested.

injury should be kept in mind. In a case similar to this patient, it would be very significant to investigate the presence of hematoma through early CT scan. As well as, immediate decision of treatment modality should be needed for preventing the other neurologic deficit.

This case has some features that distinguished from other previous ones. First of all, due to the existing L5 radiculopathy with herniated nucleus pulposus at left L4/5 level, it was accompanied by pain and mild weakness in lower extremity even before surgery. Therefore, early diagnosis of hematoma was quite challenging. If muscle strength is more weakened after endoscopic lumbar decompression, it is important to closely observe changes in muscle strength through a delicate physical examination including manual muscle test. It is also important to discriminate whether myotome of weakened muscle was involved with existing radiculopathy or not. In addition, if previous radicular pain characteristics were changed after surgery, for instance, a newly onset groin pain was developed or severity of pain was aggravated, clinicians have to strongly suspect a possibility of newly developed nerve compromised lesion. Consequently, early differential diagnosis can be very essential and challenging.

Electrodiagnostic testing is essential tool when muscle strength is weakened after spine surgery. In this case, a newly developed complete lumbar plexopathy mainly involved femoral and obturator nerves was confirmed accompanied with existing radiculopathy mainly involved L5 nerve roots by electrodiagnostic testing. If the existing lumbar herniated nucleus pulposus was involved with not L5, but L3 or L4 radiculopathy, the results of existing radiculopathy and newly developed plexopathy on the needle electromyography test might appear similar pattern, so the nerve conduction study needs to be closely examined and careful interpretation of electrodiagnostic testing would be necessary.

In conclusion, psoas hematoma should be considered in the differential diagnosis of severe groin pain and lower extremity weakness after endoscopic lumbar decompression. Abdomen and pelvis CT scan could be a useful diagnostic tool in the early period after surgery. If surgical evacuation or embolization of hematoma was not done promptly or delayed, damage to lumbar

plexus can lead to prolonged or permanent disability of lower extremity.

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