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Chronic-Contained Rupture of an Isolated Internal Iliac Arterial Aneurysm: A Case Report[1]

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We describe here a 57-year-old woman with a chronic-contained rupture of an internal iliac arterial aneurysm, and this was eroding the sacral neural foramen. Although an isolated internal iliac arterial aneurysm is known to be rare, the ruptured internal iliac arterial aneurysm was diagnosed based on the characteristic radiolgic findings with performing color Doppler ultrasound, MRI and multi-slice computed tomography. The ruptured aneurysm was successfully treated by coil embolization. Color Doppler US, MRI and multi-slice CT are useful for evaluating a mass of a vascular origin that involves the neural foramen.

Index words : Magnetic resonance (MR)
Spine
Aneurysm, ruptured
Embolization, therapeutic

A prescral mass showing a widening of the neural foramen can be misdiagnosed as neurogenic tumor on the plain radiographs and precontrast CT. We recently encountered a patient in whom a chronic-contained rupture of an internal iliac arterial aneurysm was present, and the radiographic findings suggested a presacral mass with widening of the sacral neural foramen. Subsequently, the widening of the sacral neural foramen was demonstrated to have been caused by rupture of the internal iliac arterial aneurysm without any evidence of infection. To the best of our knowledge, these atypical radiological findings of an iliac aneurysm rupture have not been previously reported.

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Case Report

A 57-year-old woman presented with an 8-month history of pelvic pain and weakness in her right lower leg. Magnetic resonance imaging (MRI) of the pelvis was initially used to evaluate her pelvic pain. The axial, sagittal and coronal T1-weighted images (600/9 [TR/TE]), the axial and sagittal T2-weighted images (4000/99), and the axial and sagittal contrast-enhanced T1-weighted (500/9) images were obtained. The lesion had low signal intensity and a marginal hyperintense signal compared to that of muscle on the T1-weighted images (Fig. 1A). Moreover, the lesion had central low signal intensity with marginal hyperintensity in the anterior two-thirds of the mass and there was low signal intensity in the posterior one-third of the mass on the T2-weighted images (Fig. 1B). On the contrast-enhanced T1-weighted images, the extravasating cavity showed strong enhancement of the anterior half of the mass and the mass contained an unenhanced chronic thrombus (Fig. 1C).

The sacral neural foramen was completely eroded by what appeared to be a presacral mass.

Ultrasound (US) showed a fusiform mass that contained a laminated mural thrombus. The aneurysm had a characteristic swirling flow pattern on the color Doppler imaging (Fig. 1D, E).

Contrast-enhanced computed tomography (CT) of the pelvis showed that the presacral mass consisted of a strongly enhanced mass anteroinferiorly and an unenhanced mass posterosuperiorly. The mass measured 5.5 ×4.7×6.6 cm. The margins of the sacral lesion were well corticated with widening of the right first sacral neural foramen. The mass displaced the right iliac vessels and the right psoas muscle (Fig. 1F, G) and the mass was not connected to the nerve roots. On several images, the anterior wall of the right internal iliac artery was abutted on a calcification and also the posterior wall of the mass. The right common iliac artery was not dilated from its origin site of the descending abdominal aorta to its bifurcation. The MR, US and CT findings were interpreted as a chronic-contained rupture of the internal iliac artery. Subsequently, the patient underwent transfemoral angiography for coil embolization of the ruptured aneurysm. The angiograms showed the extravasa-

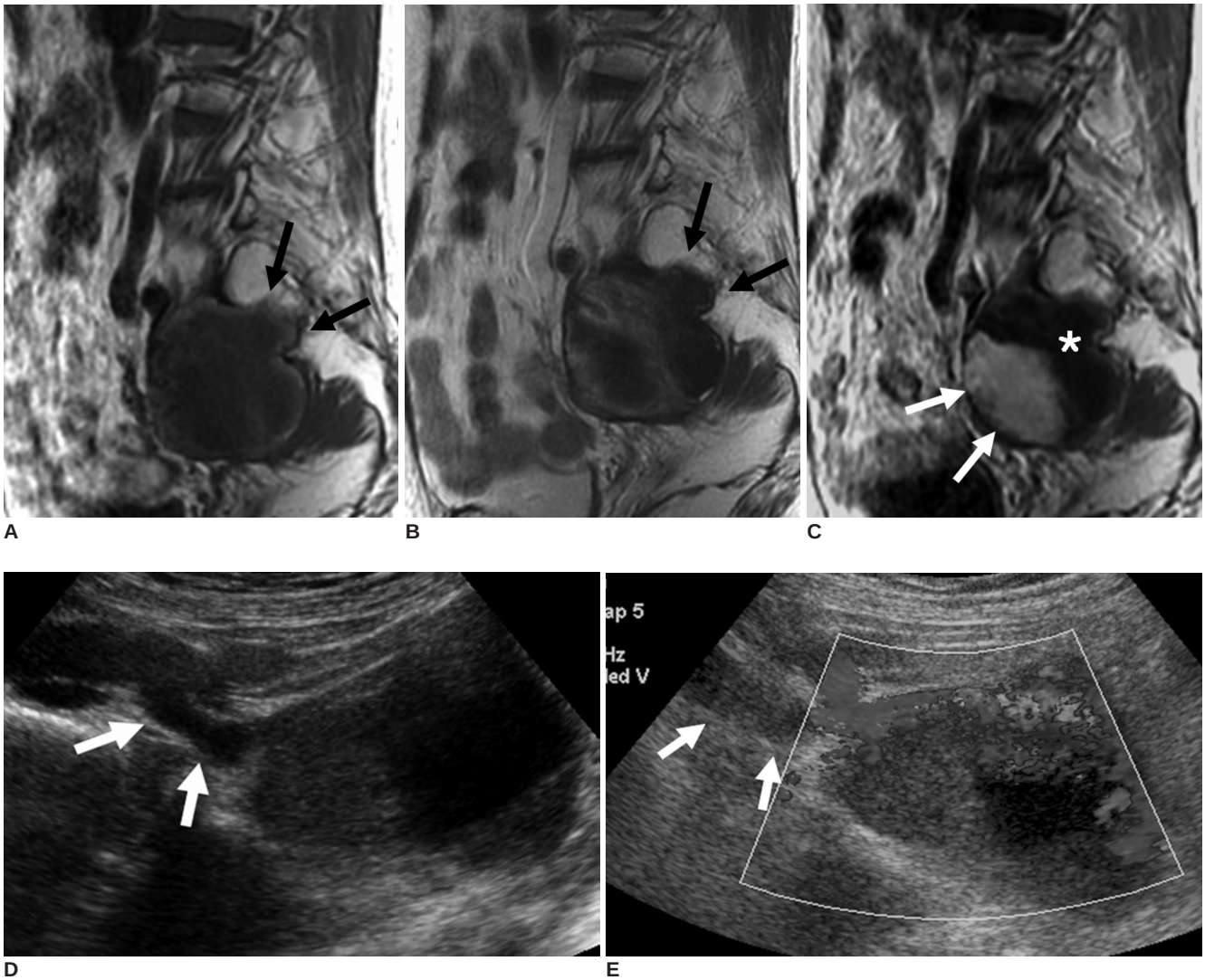

Fig. 1. Images of a 57-year-old woman with pelvic pain and weakness of her right lower leg for 8 months.
A, B. The sagittal T1-weighted (**A**) and T2-weighted (**B**) MR images of the sacrum show a presacral mass with peripheral high signal intensity and central low signal intensity. The sacral foramen is eroded by the presacral mass (arrows).
C. The contrast-enhanced sagittal T1-weighted MR image shows strong enhancement in the anterior half of the mass (arrows) and no enhancement in the posterior half of the mass (asterisk).
D, E. Pelvic ultrasound (US) shows a cystic mass adjacent to the right internal iliac artery (arrows) in the right pelvic cavity (**D**). The mass has a lobulated thick eccentric wall laterally, with an anechoic cystic portion that showed turbulent flow on color Doppler US. (**E**) The mass is connected to the internal iliac artery (arrows).

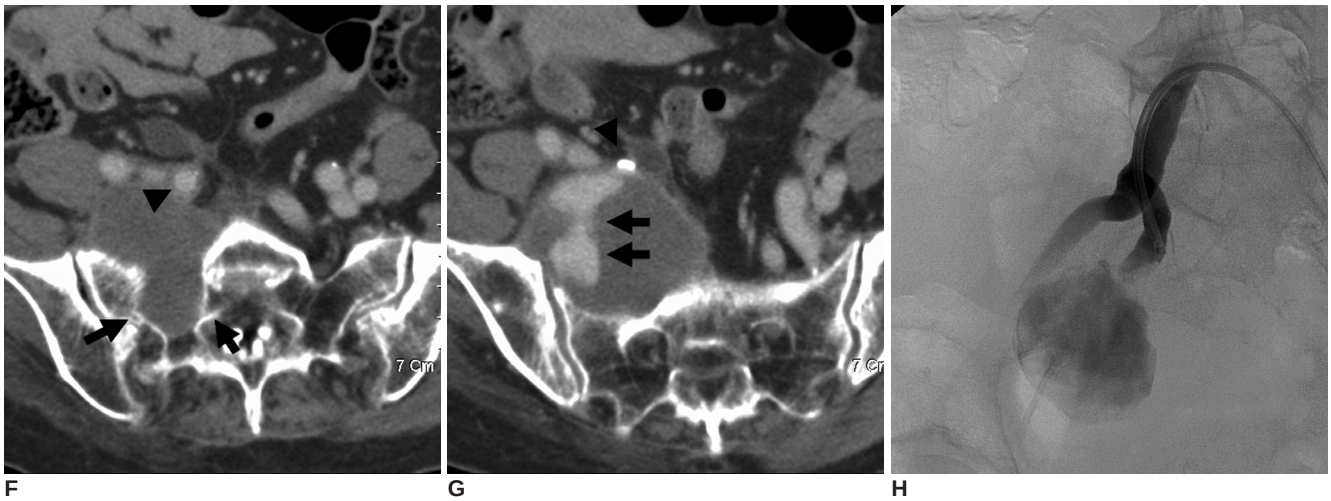

Fig. 1. F, G. Axial contrast-enhanced computed tomography (CT) of the sacrum (**F**) shows a sacral mass and widening of the right sacral foramen (arrows) with continuity along the posterior margin of the internal iliac artery (arrowhead). The CT taken 2 cm lower (**G**) shows an atherosclerotic plaque (arrowheads) anterior to the internal iliac artery and contrast material is clearly extravasating into the aneurysm (arrows).
H, I. The transfemoral angiogram (**H**) shows the extravasation of contrast material at the cutoff of the right iliac artery. On the angiogram (**I**) after coil embolization, no further extravasation from the right internal iliac artery is detected.
J. The one-year follow-up CT shows the markedly decreased size of the presacral mass and metallic artifact, and the latter was caused by the coil that was inserted in the right internal iliac artery.

tion of contrast material at the cutoff site of the right iliac artery (Fig. 1H). Coil embolization was then performed, after which no further extravasation from the right internal iliac artery was detected (Fig. 1I). The pelvic pain and weakness of the right leg improved. The one year follow-up CT of the pelvis showed shrinkage of the aneurysm and the diminished size of the erosion of the right sacral neural foramen (Fig. 1J).

Discussion

The causes of an internal iliac arterial aneurysm are atherosclerosis, infection, trauma and disorders of the arterial wall. Progressive atherosclerosis is thought to be the most common cause of this malady (1). Iliac arterial aneurysms usually develop in connection with aneurysms of the abdominal aorta, which have an incidence of approximately 10% of all patients with aneurysms, while isolated iliac aneurysms are rare and they occur in only 2% of all the patients with aneurysms (2). An isolated internal iliac arterial aneurysm is even more unusual, with an incidence of only 0.4% (3).

The internal iliac artery lies deep in the pelvis and an aneurysm may remain asymptomatic and unrecognized until it ruptures (1). Ipsilateral leg pain with neurological signs has been reported (3), and compression of the pelvic and lumbosacral nerve roots is reported to develop in 10 to 15% of these patients (4). When rupture occurs, the mortality usually ranges from 50 - 100% (5). In rare cases, the surrounding retroperitoneal tissues and bony structures effectively contain the rupture and the subsequent hematoma. Under these circumstances, the presentation is often atypical and the diagnosis is commonly delayed (6).

The mechanism of chronic-contained abdominal aortic aneurysm rupture is not fully understood. It is believed that in the case of large aneurysms, as the sac increases in size, it causes a strong perianeurysmal reaction, which subsequently protects against the extravasation of blood if the aneurysm ruptures (7).

Performing arteriography is usually limited to those patients who are being considered for elective surgical repair. Percutaneous embolization of aneurysms may be performed in selected patients (8).

Color flow Doppler studies are useful for establishing the initial differential diagnosis of other pelvic masses and these studies can demonstrate a pulsatile, characteristic swirling flow pattern within the aneurysm (9).

Computed tomography with contrast indicates the aneurysm's site and size and its relationship to other organs, and CT is now routinely recommended for elective repair (10). In our case, the central enhancement of this mass paralleled the enhancement of the internal iliac artery, thereby allowing us to conclude that this mass was of a vascular origin. This enabled us to exclude most other abnormalities such as a neurogenic tumor, and the differential diagnosis was limited to a chronic-contained ruptured aneurysm of the internal iliac artery. The calcification at the entrance of the rupture suggested that the cause of the rupture was atherosclerosis.

MRI can also detect the aneurysm and its anatomical relationships to other structures. On spin echo MRI, flowing blood is usually seen as a flow void. However, slowly flowing blood may show a signal on spin echo sequences, and this is commonly seen in aneurysms (8). In our case, the diagnosis of the ruptured aneurysm was suggested by the characteristic MR findings, including the heterogeneous signal intensity within the aneurysm on both the T1- and T2-weighted images, which indicated thrombus and turbulent flow.

In summary, color Doppler, CT, MR and multislice CT provide invaluable, noninvasive means as complementary tools to evaluate those patients who have a suspected presacral mass of a vascular origin.

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고립성 내장골 동맥 동맥류의 만성 함유성 파열의 증례보고[1]

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저자들은 57세 여자 환자의 천추 신경공을 미란시키는 내장골동맥 동맥류의 만성 함유성 파열 1예를 보고 한다. 고립성 내장골동맥 동맥류는 드문 질환으로 알려졌으나 특징적인 색도플러 초음파, 자기공명영상과 다중절편 CT 소견을 토대로 내장골동맥 동맥류 파열로 진단되었다. 파열된 동맥류는 성공적으로 코일 색전술로 치료되었다. 색도플러 초음파, 자기공명영상과 다중절편 CT 영상은 신경공을 침범한 혈관성 종괴의 진단에 유용하다고 생각된다.