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CASE REPORTS

Transcatheter Arterial Embolization of Concurrent Spontaneous Hematomas of the Rectus Sheath and Psoas Muscle in Patients Undergoing Anticoagulation

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Abstract

We report a case of concurrent rectus sheath and psoas hematomas in a patient undergoing anticoagulant therapy, treated by transcatheter arterial embolization (TAE) of inferior epigastric and lumbar arteries. Computed tomography (CT) demonstrated signs of active bleeding in two hematomas of the anterior and posterior abdominal walls. Transfemoral arteriogram confirmed the extravasation of contrast from the right inferior epigastric artery (RIEA). Indirect signs of bleeding were also found in a right lumbar artery (RLA). We successfully performed TAE of the feeding arteries. There have been few reports in the literature of such spontaneous hemorrhages in patients undergoing anticoagulation, successfully treated by TAE.

Key words: Hemorrhage—Rectus sheath—Psoas muscle—Anticoagulant therapy—Transcatheter embolization

Spontaneous extra-peritoneal hematomas could be common and sometimes life-threatening conditions in patients undergoing anticoagulation therapy [1–3]. Commonly these hematomas originate in the context of the muscles of the anterior abdominal wall and of the psoas, and rarely these are located in both sites [4]. We present a case of concurrent spontaneous hematomas of the rectus sheath and psoas muscle in a patient undergoing anticoagulation therapy, with severe hemorrhagic shock, treated by TAE of inferior epigastric and lumbar arteries.

Case Report

A 67-year-old male presented with acute pain and palpable mass in the lower abdominal. He had a retroperitoneal bleeding 2 years ago during anticoagulation therapy that was treated conservatively. He had been admitted 7 days previously because of a suspected pulmonary thromboembolism, treated with anticoagulant therapy. The patient reported that the onset of the pain followed exertion. Physical and ultrasound (US) examination revealed a smooth mass which was present in the right lower abdomen. Laboratory findings were as follows: hemoglobin, 12.0 g/dl; hematocrit, 34.3%; red blood cell count, 4,800,000/mm^3; white blood cell count, 9,800/mm^3. The patient was then treated conservatively.

However, in the next 48 hours the symptoms worsened and the hematocrit level decreased by 20 points. Emergency enhanced CT (slice thickness of 5 mm, table speed of 7.5 mm and Pitch 1.5 after iv administration of 140 ml of contrast medium at a rate of 3 ml/sec) showed a smooth-shaped mass in the layers of the anterior abdominal wall, enlarging the normal morphology of the right rectus abdominis muscle, with signs of active bleeding (Fig. 1). The CT scan also showed another mass with the same characteristics, in the context of the right psoas muscle (Fig. 1). The patient underwent transfemoral angiography that disclosed direct signs of bleeding from the RIEA (Figs. 2,3,4). Abnormal morphology of a RLA was also detected (Fig. 5). Both arteries were embolized by using microcatheter (0.018 FastTracker, Target Therapeutics, Boston Scientific, Natick, USA) and microcoils (size 3 × 30 mm Cook McReye, William Cook Denmark, Europe) (two for the epigastric and one for the lumbar artery) (Fig. 4, 6). The patient was discharged 5 days later and is still doing well after 9 month follow-up.

Discussion

The popular use of anticoagulant therapy in the pharmacological management of multiple conditions increases the rate of spontaneous hematomas [2]. The rectus sheath and the psoas muscles represent the most common sites of spontaneous bleeding in patients undergoing anticoagulation therapy [1, 3, 5]. These hematomas originate from tears in muscle fibers and are rarely bilateral [6]. Other rare sites of bleeding are the mediastinum or intramural visceral sites [1, 2, 7, 8, 9]. Small vessel arteriosclerosis [10], or related phenomenon to a thrombotic genesis involving the adrenal glands, may or may not correlate with the presence of heparin-induced immune microangiopathy [11]; they are the most accepted pathogenetic processes. Radiological evaluation, i.e., US or CT examination, in association with clinical history, symptomatology (pain, blood loss, hypotension and ecchymosis), play a basic role in the differential diagnosis and preoperative localization of rectus sheath or psoas hematomas [1, 3, 4, 12].

In hemodynamically stable conditions, the common management currently continues to be conservative (suspension of anticoagulation treatment, correction of the anticoagulation state, volume resuscitation, and supportive measures) [13–15]. In uncontrollable hemodynamic patients, surgical intervention has been considered

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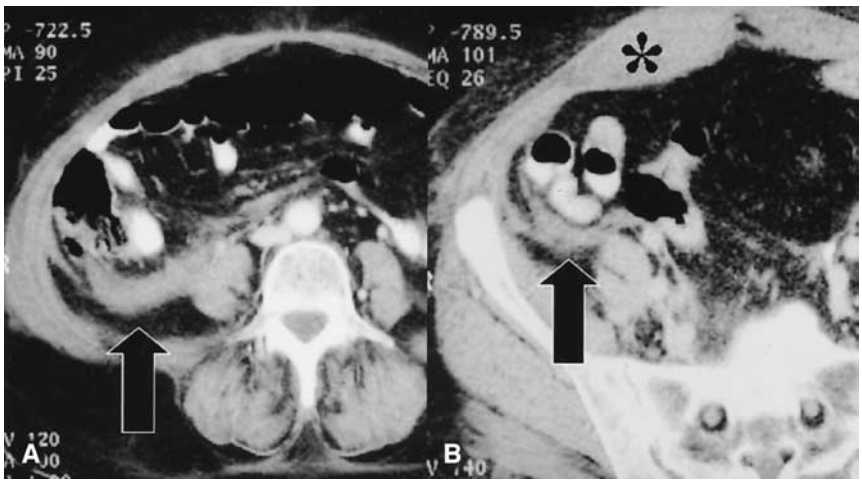
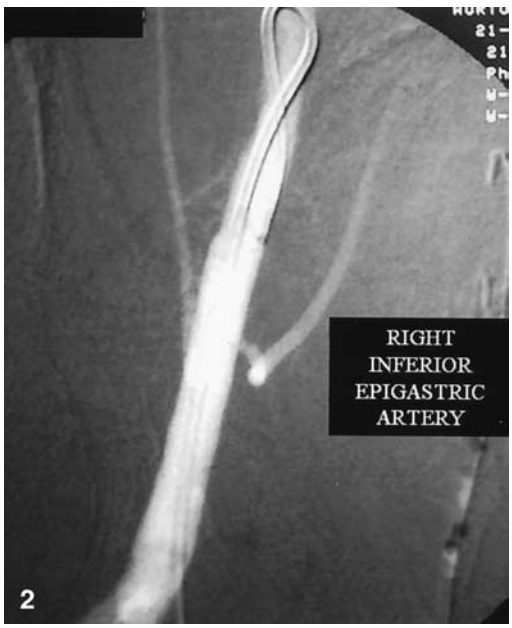
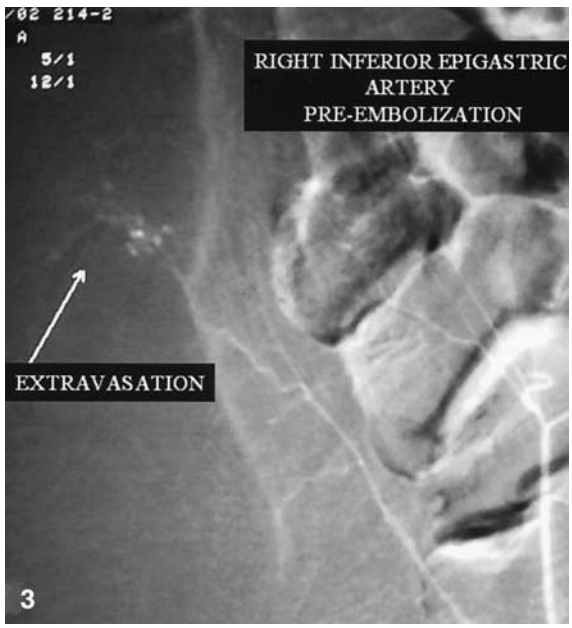


Fig. 1. Enhanced CT shows proximally (**a**) an enlarged right psoas muscle with retroperitoneal haematic collection (arrows), and distally (**b**) a hematoma of the right rectus sheat muscle (asterisk)





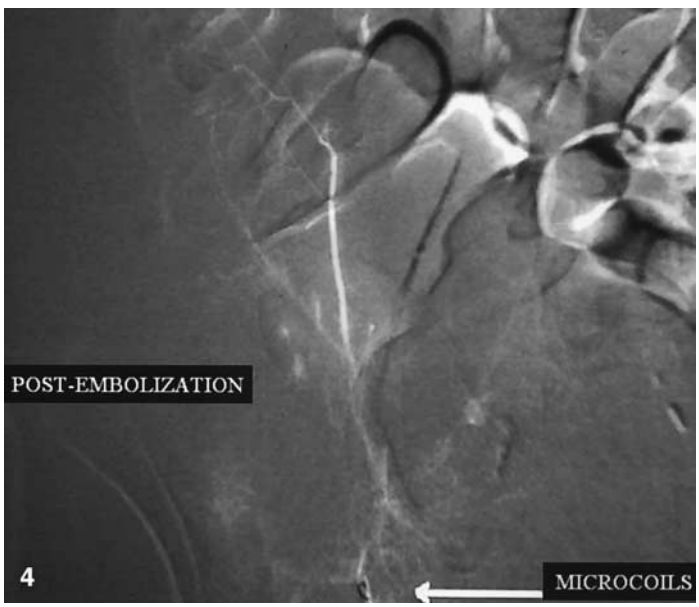


Fig. 2. The angiogram shows the origin of the right inferior epigastric artery approached by using a 4 French Sim 1 catheter

Fig. 3. Injection of contrast into the right inferior epigastric artery shows direct sign of bleeding (extravasation of contrast medium)

Fig. 4. Post-TAE control shows complete occlusion of the bleeding right inferior epigastric artery.

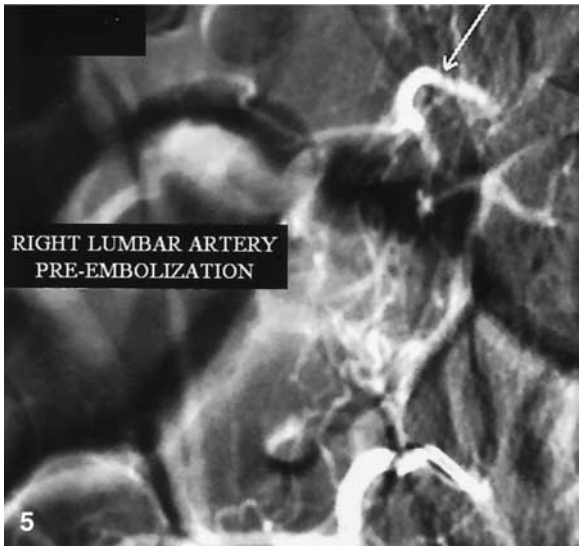


Fig. 5. Right lumbar artery angiogram shows tortuosity and anarchic morphology of the vessel, accepted as indirect signs of bleeding.

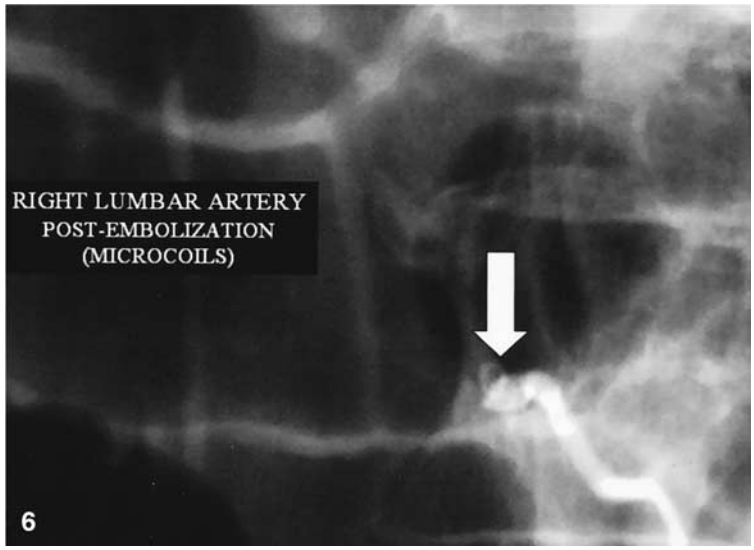


Fig. 6. Post-TAE control shows complete occlusion of the right lumbar artery.

the only option [16], although it is severely limited by the inability to localize or control the bleeding vessel(s). In case of pain related to the enlargement of psoas district, percutaneous decompression could also be indicated [17].

The role of TAE in the treatment of abdominal wall hematomas has not been stated. As reported by Sharafuddin et al. [18], this is likely because the common belief is that this entity is caused by diffuse microvascular pathology; hence, angiography is seldom requested [18]. Only 10 cases of TAE for spontaneous bleeding from abdominal wall arteries in patients undergoing anticoagulant therapy have been reported [12, 18–21]. In 9 cases only an artery was embolized as the main source of bleeding (epigastric arteries $n = 2$, lumbar arteries $n = 6$, and deep circumflex iliac artery $n = 1$); in 1 case different arteries were embolized (inferior epigastric, deep and superficial circumflex iliac arteries). There is another report of TAE of the inferior epigastric artery supplying a rectus sheath hematoma in a patient with anticoagulant therapy, however, the hemorrhage could not be considered "spontaneous" because it was secondary to a percutaneous biopsy of an abdominal lymphoadenopathy [22]. Coils were used in 6 cases [18, 19], microcoils plus n-butyl cyanoacrylate in 1 case [21], particles in 2 [12], and in 1 reported case the used material was not indicated [20]. In our case we used microcoils agreeing with the theory of Sharafuddin et al. Thus, because a part of the standard advantages (radiopacity, accuracy, and safer deployment), coils or microcoils are able to pack the entire length of the major supplying vessel(s), preventing retrograde filling from collaterals; this is probably due to the fact that the bleeding at the rectus sheath or psoas muscle is often multifocal and involves complex collateral pathways [18]. In our case, the unstable hemodynamic conditions of the patient and the presence of active bleeding signs at CT indicated the use of angiography and the subsequent successful embolization.

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