

II. Pre-surgical diagnosis

Peripheral arterial aneurysms primarily appear as a local pulsating lump. When the lump is large, there may be constriction of peripheral nerves and vessels and ischemia of the extremities, as well as symptoms of pressure on nearby tissues and organs. If a blood clot on the interior breaks free, embolisms may be caused in the extremities or organs. Patients in this group were all given CTAs prior to surgery, to pinpoint the position of the aneurysm, its size, and the specific scope of blood vessels involved, and to precisely measure the endpoints of the affected section of artery. Color Doppler imaging (CDI) was utilized to thoroughly examine the condition of arteries along the insertion pathway and complete the preparation for surgery.

III. Treatment methods

13 patients underwent either puncture of the femoral artery or brachial artery cutdown. The specific condition of the arterial aneurysm was clarified through imaging, and, based on the requirements of the membrane-covered stent to be inserted, a long sheath of a certain diameter and length was selected to establish a pathway in the artery. In one patient with an aneurysm of the internal carotid artery, the pre-surgical CTA showed a ruptured arterial aneurysm of the internal carotid artery accompanied by extensive parietal thrombus. To prevent the thrombus from detaching and moving through the circulatory system as a result of surgical procedures, a 90cm long sheath was first inserted into the common carotid on the affected side and after an EPD was inserted into the internal carotid an 8*10mm Viabahn stent was placed to cover the aneurysm (see Figure 1). One patient had a subclavian aneurysm accompanied by pathological narrowing of the opening, for which reason a simultaneous puncture of the femoral artery and cutdown of the brachial artery on the affected side were performed. A 12*60mm naked stent was introduced into position at the base of the common carotid artery via the femoral and innominate arteries on the affected side, and a coated stent inserted through the brachial artery. The initial narrowed segment under the clavicle and the aneurysm-like pathological expansion were removed (figure 2). Three patients had aneurysms in arteries to internal organs, with the choice made to go in through an opening in the brachial artery. Two patients with aneurysms of the superior mesenteric artery had 55cm long sheaths inserted into the ventral aorta, and after the precise position of the pathology was established via the superior mesenteric artery, a Viabahn membrane-covered stent was inserted to repair the arterial aneurysm (Figure 3); in one patient with an aneurysm of the celiac trunk, with a large branch vessel going into the aneurysm, the branch vessel embolism was treated first before a Viabahn was inserted (Figure 4). In 2 patients with false aneurysms of ileal arteries, the Seldinger technique was used to puncture the femoral artery on both sides, and imaging taken of the ventral aorta to show pathology and position. The aneurysms were seen to involve the internal iliac artery opening < 1cm from the rupture of the aneurysm, and it was considered that hypogastric leakage could occur after use of a membrane-covered stent, for which reason a puncture was first performed on the femoral artery on the unaffected side and insertion done across into the internal iliac artery. A sufficient size and quantity of spring steel plugs were used to seal the main trunk of the internal iliac artery on the affected side, and an arterial puncture done on the affected side, with a series of treatments with a membrane covered stent to cover the false aneurysm. 1 case was an aneurysm of the common femoral artery accompanied by an arteriovenous malformation in the thigh with localized heavy pigmentation in the skin and shallow phlebitis. Consideration was given to repairing the common femoral artery, but given the high probability of infection from the surgery to reconstruct the superficial femoral artery, arterial puncture was performed on the opposite side, moving across into the femoral artery on the affected side. The deep femoral artery was first embolized, and a 10*150mm Viabahn inserted into the common femoral artery to repair the aneurysm with satisfactory results (see Figure 5). 2 cases showed traumatic aneurysm of the superficial femoral artery due to severe edema of the limbs, so a puncture was done on the femoral artery on the unaffected side and a 55cm long sheath inserted across into the affected area. When the position of the aneurysm was precisely established, a Viabahn was inserted (Figure 6). 1 case showed a 5cm diameter true arterial local aneurysm with severe distension in places. The entire length of the superficial femoral artery was imaged and a localized aneurysm detected in the middle section of the superficial femoral artery. Three Viabahns were inserted from remote locations to repair, with satisfactory results. See Figure 7 for 12 month post-surgical follow-up CTAs.