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ENDOVASCULAR MANAGEMENT OF MAY-THURNER SYNDROME

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ABSTRCAT:

May-Thurner syndrome or iliac vein compression syndrome is deep vein thrombosis resulting from chronic compression of the left iliac vein against lumbar vertebrae by the overlying right common iliac artery. Historically, the treatment for patients with iliac vein compression syndrome has been anticoagulation therapy. When given alone, however, this therapy can be problematic because it prevents the propagation of the thrombus without eliminating the existing clot. Furthermore, it does not treat the underlying mechanical compression. Consequently, when deep vein thrombosis is treated with anticoagulation therapy alone, there is a significant chance that the patient will develop recurrent deep vein thrombosis or post thrombotic syndrome or both. Recently, both retrospective and prospective studies have suggested that endovascular management should be front-line treatment; endovascular management actively treats both the mechanical compression with stent placement and the thrombus burden with chemical dissolution. We report our case of 53y old male patient with May Thurner syndrome managed by endovascular treatment.

الملخص العربي:

علاج متلازمة الحرقفي من خلال العلاج من داخل الوعاء الدموي

وائل ابراهيم، زكريا صفران، حسام حسن، وائل ابو زيد
قسم التصوير الطبي، وحدة التدخل، مستشفى الملك فهد التخصصي، الدمام، المملكة العربية السعودي

متلازمة الحرقفي أو متلازمة ضغط الوريد هي الجلطة الناتجة عن ضغط مزمن في الوريد الحرقفي الأيسر ضد الفقرات القطنية من قبل الشريان الحرقفي المشترك الأيمن. تاريخيا، كان العلاج للمرضى الذين يعانون متلازمة الوريد الحرقفي يتم باستخدام علاج منع تخثر الدم. الأ أنه عندما يعطى هذا العلاج بمفرده ، يمكن فأنه يمنع أنشار خثرة تجلط الدم من دون أن يعالج الخثره المتكونة بالفعل. وعلاوة على ذلك، فإنه لا يعالج ضغط الميكانيكي علي الوريد. وبالتالي، عندما يتم التعامل مع جلطة العلاج بمنع تخثر الدم وحده، يكون هناك فرصة كبيرة لحدوث متكرر للجلطة أو متلازمة ما بعد الجلطة أو كليهما. في الآونة الأخيرة، أوصت كل من الدراسات والتي أجريت بأثر رجعي أو بدراسة الاحتمالات أن العلاج من داخل الأوعية الدموية يجب أن يكون خط المواجهة الأول في هذا العلاج، أن العلاج من داخل الأوعية الدموية يتعامل بنجاح مع كلا من الضغط الميكانيكي من خلال وضع دعامة ويتعامل مع خثرة الدم من خلال الحل الكيميائي لها. نحن نقدم حالتنا لمريض ذكر يبلغ من العمر53 عام , يعاني من متلازمة الحرقفي وتم من داخل الأوعية الدموية

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INTRODUCTION:

In 1957, May and Thurner described three varieties of intra-luminal spurs occurring in the left common iliac vein close to its junction with the inferior vena cava. The incidence of May-Thurner syndrome is unknown and ranges from 18–49% among patients with left-sided lower extremity DVT.[1] May and Thurner postulated that the chronic pulsations of the overriding right iliac artery led to the development of a "spur" in the vein wall, and that this spur would result in partial venous obstruction, Chronic trauma to the inner side of the vein wall due to adjacent arterial pulsations leads to the accumulation of elastin and collagen, contributing to spur formation.[2] In addition to the chronic arterial pulsations, mechanic compression of the iliac vein by the thick-walled overriding iliac artery,Figure1. leads to extensive local intimal proliferation, impaired venous return and venous thrombosis. In addition to the mechanical alterations to the vessel wall, hypercoaguable states, when tested, are found in the majority of patients. Kolbel et al[3] found underlying hypercoaguable disorders in 67% of patients screened prior to treatment of chronic iliac vein occlusion. Left iliac vein compression is the most common variant seen in May-Thurner syndrome; however, several other variants have been described in the literature.

Figure1. CT abdomen and pelvis with contrast showing compression of left iliac vein by left iliac artery, multiple collaterals seen at abdominal wall.

Compression of the left common iliac vein by the left internal iliac artery,[4] compression of the right common iliac vein by the right internal iliac artery,[5] compression of the inferior vena cava by the right common iliac artery[6] and right-sided May-Thurner syndrome in a patient with a left-sided inferior vena cava[7] have all been described.

CASE REPORT:

Our patient is 53 years male old, diabetic hypertensive presented with persistent painless swelling of the left thigh of about 7 years duration. The swelling had gradually become more severe. Physical examination revealed a swollen left thigh, which was 15 cm larger in circumference than the right thigh. The patient had two episodes of deep venous thrombosis the last one was 2 weeks back which dramatically aggravated his symptoms. He was treated with warfarin 6mg and aspirin 300 mg with no appreciable improvement. Venous Doppler ultrasonography (US); revealed left common femoral thrombosis, occluded left common iliac vein with subsequent aneurysmal dilatation of external iliac vein. abdominopelvic computed tomography (CT) was done Dual-phase thin-section (section thickness, 1.25 mm) abdminal CT was performed at arterial (angiography) and venous (venography) phases with fourchannel multi–detector row CT. Threedimensional volume rendering and transverse CT demonstrated normal arterial anatomy and compression of the left common iliac vein by the left common iliac artery with total occlusion of the common iliac vein ,aneurysmal dilatation of left external iliac vein with multiple collaterals seen along left thigh and anterior abdominal wall, as well as evident thrombosis of common femoral vein which extended down to involve superficial femoral and popliteal veins . No pelvic mass was noted. Endovascular venoplasty was decided.

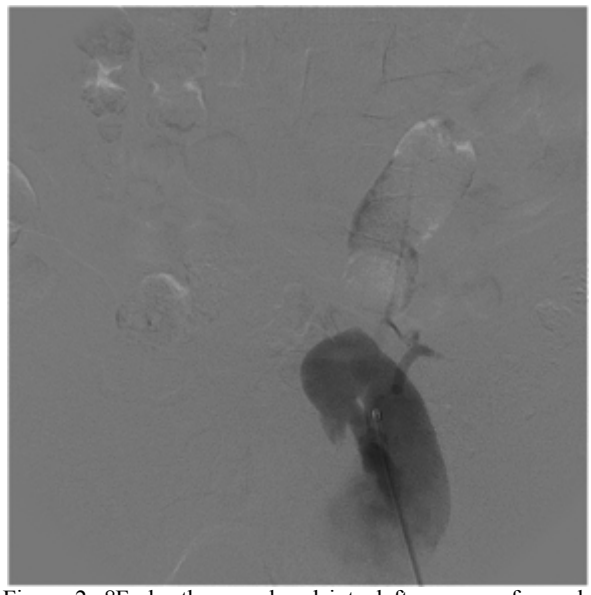

Figure 2. 8F sheath was placed into left common femoral vein, venogram revealed total occlusion of left common iliac vein with subsequent aneurysmal dilatation of left external iliac vein with multiple collaterals.

A 6-F sheath was placed into the right common femoral vein; Rt iliac venography and cavogram was done followed by deployment of retrievable IVC filter just below renal vein (Retrievable OptEase filter by Gohnson and Gohnson company) , another 8 F sheath was placed into left common femoral vein, venogram was done which revealed total occlusion of left common iliac vein with subsequent aneurysmal dilatation of left external iliac vein with multiple collaterals, Fig2. microcatheter(Renegade by Boston scientific) was successfully manipulated over 0.18 wire (Transend .18 wire by Boston Scientific) and successfully transverse through occluded segment to IVC cavogram was done which confirm position of microcatheter, multiple balloon dilatation were done starting by 2mm x6mm (Sleek balloon by Clear Stream Technologies) followed by 4,6,8,10,and 12x 40mm (Powerflex balloon by Gohnson and Gohnson company). A 14mm × 40-mm Wallstent (Boston Scientific, Galway, Ireland) was deployed across the occluded segment of the vein. The stent was dilated to 14 × 40 mm with the angioplasty balloon. A post-angioplasty venogram demonstrated a widely patent stent and good contrast material flow through the stent into the inferior vena cava, without filling of the cross-pelvic collaterals, Fig 3.

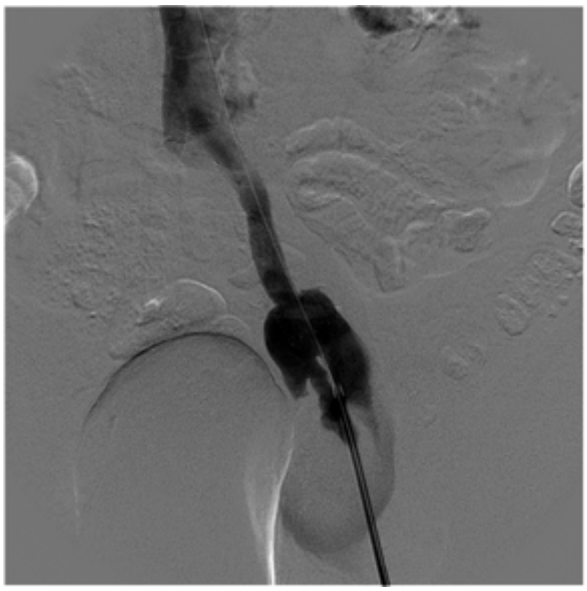

Figure 3. A post-angioplasty venogram demonstrated a widely patent stent and good contrast material flow through the stent into the inferior vena cava, without filling of the cross-pelvic collaterals.

Measurement demonstrated no pressure gradient across the stent in the supine position. The patient was discharged from the hospital on the same day and prescribed the following drug regimen: 300 mg of aspirin daily for life and 75 mg of Clopidogrel (Plavix, Sanofi-Dogu, Istanbul, Turkey) daily for 6 weeks. At 2weeks follow-up, Doppler US revealed patent venous stent, and left thigh edema was dramatically decreased, IVC filter was retrieved. At 3-month follow-up, Doppler US revealed patent venous stent, and left thigh edema was substantially decreased.

DISCUSSION:

A history of persistent left lower extremity swelling with or without deep venous thrombosis in a woman between the 2nd and 4th decades of life, without an obvious cause, is highly suggestive of May-Thurner syndrome, and this possibility should be assessed with CT and iliac venography. It is not an infrequent source of venous abnormalities in the left lower extremity. The true prevalence of this disorder is unknown. With the move away from venography and the increased use of noninvasive diagnostic measures to confirm the presence of venous thrombosis, many cases of the left iliofemoral venous thrombosis associated with May-Thurner syndrome are probably not recognized. The overlying artery appears to induce a partial obstruction of the vein in two ways: by its anatomic orientation with subsequent physical entrapment of the left common iliac vein and by extensive intimal hypertrophy of the vein resulting from the chronic pulsatile force of the right common iliac artery. This condition has been estimated to occur in 2%–5% of patients who undergo evaluation for lower extremity venous disorders, and it is not known why the normal anatomic relationship between the left common iliac vein and right common iliac artery is disrupted and begins to interfere with venous flow. Reported findings show that lower extremity deep venous thrombosis occurs three to eight times more frequently in the left side than on the right. In 1943, Ehrich and Krumbhaar performed anatomic dissections in 412 cadavers and found obstructive lesions in 23.8% of the left common iliac veins. Histologically, these lesions did not represent chronic recanalized clot; rather, they were composed of elastin and collagen, without inflammatory cellular infiltration or irregular arrangement of scar. They also found that 33.8% of lesions occurred after the 1st decade of life and concluded that the lesions were acquired and not congenital. Patients with May-Thurner syndrome typically present with unilateral (left) lower extremity edema and pain. A propensity for this disorder is seen in young women in their second to fourth decade of life, after pro-

longed immobilization or pregnancy. Because of the chronic nature of the disease process, patients may also present with stigmata associated with post-thrombotic syndrome such as pigmentation changes, varicose veins, chronic leg pain, phlebitis and recurrent skin ulcers. The clinical stages of iliac vein compression were described by Kim et al, and include: Stage I, asymptomatic iliac vein compression; Stage II, development of a venous spur; Stage III, development of left iliac vein DVT.The diagnosis of May-Thurner syndrome is based on the clinical presentation of left lower extremity swelling and pain in association with radiologic evidence of compression. This being said, diagnosis of May-Thurner syndrome may not always be straightforward. Doppler ultrasound will detect if a DVT is present in the iliac vessels, but is unable to visualize iliac vein compression and spurs. Other diagnostic modalities include helical abdominal computed tomography (CT), CT venography, magnetic resonance venography (MRV), intravenous ultrasound (IVUS) and conventional venography. Kibbe et al[8] used abdominal helical CT scanning to determine the incidence of left common iliac vein compression in an asymptomatic population. They found that two-thirds of all patients studied had at least 25% compression of the left iliac vein. The authors concluded that compression of the left iliac vein may be a normal anatomic finding, and that abdominal CT scanning is accurate in determining if left iliac vein compression is present. There are, however, limitations to the use of abdominal CT scanning in determining if iliac vein compression is present. The CT scans were obtained during the arterial phase of the intravenous bolus, which limits the type of vessel reconstruction and analysis that can be performed. CT venography may be used as an effective adjunctive modality when there is a known DVT. Chung et al[9] found that CT venography was just as specific and highly sensitive in the diagnosis of DVT compared with ultrasound and accurately delineated venous anatomy and the extent of thrombus present. A limitation of CT venography involves the inability to control for the volume status of the patient, which could lead to overemphasis of the degree of compression of the left iliac vein in a dehydrated patient. The traditional "gold standard" for diagnosis of May-Thurner syndrome is conventional venography, which can be diagnostic and therapeutic when endovascular therapy is used. Non-invasive imaging methods are being used increasingly to diagnose DVT and iliac compression. The aforementioned imaging modalities may help in planning catheter-directed thrombosis without the initial need for conventional venography. These non-invasive imaging modalities are simple, efficient and cost-effective in diagnosing DVT associated with iliac compression.[2] May-Thurner syndrome is a progressive disease with substantial long-term disabling complications. An aggressive approach designed to relieve the mechanical compression should be strongly considered. Multiple surgical treatment options have been advocated. These include vein-patch angioplasty with excision of intra luminal bands, division of the right common iliac artery and relocation behind the left common iliac vein or inferior vena cava, and contra lateral saphenous vein graft bypass to the ipsilateral common femoral vein with creation of a temporary arteriovenous fistula (Palma cross over) . Overall, the reported long-term success, defined primarily as patency of the left common iliac vein or venous bypass, is 40%–88%. More recently, treatment with endovascular techniques has been described. The first known report of treatment of May-Thurner syndrome solely by endovascular means was by Berger et al in 1995, who successfully placed a venous stent to relieve iliac compression. Several subsequent studies have demonstrated efficacy in the treatment of iliac vein compression with thrombectomy and endovascular stenting. ' Self-expandable stents are used in the venous system as they can cover long distances, are easy to re-sheath and have adequate durability. Balloon-expandable stents may be used if needed (insufficient response to pre dilatation/self-expandable stent). Extending the stent into the inferior vena cava (IVC) may be done without increasing the risk of contra lateral iliac vein occlusion.[10]In summary, it is important to recognize that persistent edema of the left leg may be caused by May-Thurner syndrome, especially in young women. This diagnosis is confirmed with ascending iliac venography, which demonstrates the iliac vein compression. The mechanical compression should be relieved prior to the onset of deep venous thrombosis and venous insufficiency. Management of May-Thurner syndrome has evolved over the past few decades favoring endovascular management as the primary treatment. With early recognition and aggressive management, MayThurner syndrome can be a well-managed disease.

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