

Combined Lymphangioma and Hemangioma of the Spleen in a Patient with Klippel–Trénaunay Syndrome

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SUMMARY

Introduction Klippel–Trénaunay syndrome (KTS) is a very rare congenital anomaly of blood vessels, characterized by the following clinical triad: varicose superficial veins, port-wine stain and usually bony and soft tissue hypertrophy of extremities, most often located in the lower extremities. It is often accompanied by visceral manifestations, and rarely combined with splenomegaly.

Case Outline A 30-year-old female patient came to the Surgery Clinic because of occasional left hypochondrial pain. After she was diagnosed with KTS combined with splenomegaly, splenectomy was performed. Macroscopic and microscopic spleen examination indicated the presence of tumor of vascular origin, presenting a combination of lymphangioma and hemangioma.

Conclusion Diagnosed KTS demands a thorough clinical examination of the patient because of the potential presence of visceral manifestations. When splenomegaly is present, even though being often benign, splenectomy is usually performed to alleviate accompanying symptoms which occur as a result of organ enlargement and compression, to prevent rupture and consequential bleeding when the vascular spleen tumor is large, and finally to avoid a possibility of malignant transformation.

Keywords: Klippel–Trénaunay syndrome; splenomegaly; hemangioma; lymphangioma

INTRODUCTION

Klippel–Trénaunay syndrome (KTS) is a very rare congenital anomaly of blood vessels, characterized by the following clinical triad: varicose superficial veins, port wine stain and bony and/or soft tissue hypertrophy of extremities, usually unilateral and located in the lower extremities [1, 2]. Manifestation of the complete triad occurs in 63% of patients with KTS [3], but in order to diagnose its presence two signs are needed [4, 5]. This syndrome is sometimes associated with visceral vascular malformations which additionally make the patient's general condition more complex. These malformations usually include hemangiomas or lymphangiomas of the colon, small intestine, bladder, kidney, spleen, liver and central nervous system [1, 3, 6, 7, 8]. Most frequent complications are stasis dermatitis, coagulopathies, pulmonary embolism, heart failure, bleeding from altered blood vessels, mostly from the gastrointestinal and genitourinary tract. Mortality rate in patients with KTS is about 1% [3].

We are presenting a case of a 30-year-old female patient diagnosed with KTS and associated splenomegaly due to the presence of a benign tumor of vascular origin, which according to histological characteristics, represents a combination of lymphangioma and hemangioma.

CASE REPORT

A 30-year-old female patient came to the Surgery Clinic because of the occasional left hypochondrial pain that lasted for several months. During the clinical inspection a giant hemangioma was noticed on the left leg, mostly located on the thigh and to a less extent on the knee and lower leg area. The left leg was hypertrophic, deformed and shorter in comparison to the right one, which did not have any pathomorphological changes (Figure 1). Enlarged spleen was detected by abdominal palpation, whereas physical findings of other body systems were normal. The patient was diagnosed with KTS.

There was no family history of any similar diseases among the closest relatives. Immediately after admission to the Clinic, necessary laboratory and diagnostic analyses were performed. Cardiac and lung examination did not indicate any abnormalities. Magnetic resonance imaging of the abdomen showed an enormously enlarged multicystic spleen, of the largest diameter 123×101.8 mm, reaching the pelvic bones. Cysts in the spleen were up to 15 mm in diameter among which one was conspicuous with 11×10 cm in diameter, located in the upper part and filled with liquid material (Figure 2).

Laboratory analysis findings: red blood cells $3.65 \times 10^{12}/l$, hemoglobin 113 g/l, hematocrit

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Figure 1. Depiction of the lower extremity of the patient, a giant hemangioma of the left leg, which is hypertrophic, shortened and deformed



Figure 2. Magnetic resonance imaging of the lien

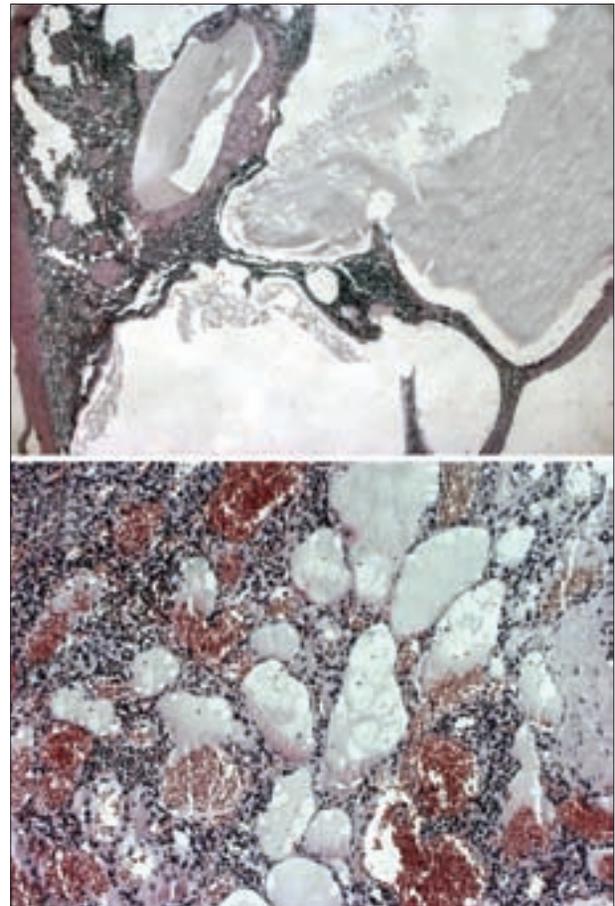


Figure 3. Histopathological finding of the spleen (hematoxylin and eosin staining, original magnification $\times 200$)

0.337, white blood cells $4.7 \times 10^9/l$, platelets $160 \times 10^9/l$, aPTT 37.9 s, INR 1.267, fibrinogen 1.676 g/l. Due to the enormously enlarged spleen and accompanying symptoms, elective splenectomy was indicated. Laparotomy was performed by opening the abdomen with a left subcostal incision and an intraoperatively enormously enlarged spleen, approximately 260 mm in diameter, was noticed. Splenectomy was performed in the usual way, without any significant bleeding during the intervention. Removed spleen was sent for pathohistological analysis. Macroscopically, removed spleen weighted 550 g, and was $260 \times 150 \times 65$ mm in diameter, grey brown in color, with uneven surface. Tissue sections showed a larger number of cystic spaces, sized from a few millimeters to several centimeters (the largest cavity was 11 cm in diameter), which were partially filled with blood and partially with a yellowish clear content. On the periphery of the multicystic mass, a zone of brown red spleen tissue was noticed. Microscopically, a tumor was detected in the spleen, which was composed of numerous dilated lymph and venous blood vessels, irregular in shape, consisting of either blood or eosinophil content and coated with flattened endothelial cells. The surrounding spleen tissue, apart from a mild degree of white pulp atrophy and hyaline degeneration of the blood vessel walls, did not indicate any other histological changes. The diagnosis of benign tumor was passed, and the tumor was determined to be a combination of spleen lymphangioma and hemangioma (Figure 3). The postoperative course was normal, and the patient was discharged three weeks after surgery.

DISCUSSION

Klippel-Trénaunay syndrome (KTS) represents a combination of port wine stain, varicose veins and hypertrophy of bones and/or soft tissues. The syndrome was described for the first time by Klippel and Trénaunay in 1900 [9]. Frederic Parcs Weber described a similar triad in 1907, but accompanied by arterial/vein fistulas as primary pathology [10].

Although being very rare, KTS is described well in the literature. Analysis of the largest published series of 268 patients has reported that port wine stains were present in 98%, pathomorphological vein changes in 72%, and extremity hypertrophy in 67% of patients [3]. Vein malformations often involve agenesis, hypoplasia, persistent embryonic veins, valvular insufficiency and aneurysms.

Even though the etiology of this syndrome is unknown, there are more and more data about the connection with heterogeneous gene mutations [11]. Szilagyi et al. [12] noted that the possible cause was an abnormal development of mesoderm causing the enlargement in size and vein number, which led to bone and soft tissue hypertrophy. This theory is supported by the opinion according to which mesodermal abnormality is actually a result of defect in vascular endothelial growth factor (VEGF) mediated by vascular remodeling [13]. Most of KTS cases are sporadic and congenital trend has not been confirmed yet, although cases within the same family have been recorded [14]. In the series of 114 patients, two families with congenital

KTS have been recorded, as well as the phenomenon of family hemihypertrophy of lower extremities within the first degree relatives [15]. KTS manifests at birth or early childhood. In 75% of cases it manifests before the age of 10 years, being equally frequent within both genders, regardless of race [3, 13]. Our patient was diagnosed with KTS immediately after birth. Patients with this syndrome often have systematic manifestations as visceral vascular malformations. Most often they involve hemangiomas and/or lymphangiomas with the incidence of up to 56% in some series [16]. Skin malformations in KTS are mostly capillary hemangiomas. Skin capillary malformations are diffuse or mostly located on the hypertrophic extremity side. Lower extremities are affected in about 95% of cases [3, 13]. In the case of the patient we present, hypertrophy and hemangioma are located on the left leg. Depth of affected tissue also varies; changes can be limited to the skin only or can affect subcutaneous tissue, muscles and bones [8]. The spleen is rarely affected in patients with KTS, and can appear as splenomegaly, hemangioma and/or lymphangioma of the spleen [2, 8]. In the case of our patient, splenomegaly was caused by a mixed tumor of vascular origin with characteristics of both hemangioma and lymphangioma. The available literature records only two cases of KTS with associated lymphangiohemangioma of the spleen [8, 17]. Data also indicate that this type of vascular malformations is often followed by disorders of hemostasis, especially in patients with coagulopathies [18, 19]. A mild degree of disorder was noticed in our patient, and was successfully treated. The diagnosis of a visceral tumor mass of vascular origin is easily made. Percutaneous biopsy is not recommended due to high bleeding risk. Noninvasive visualization imaging methods as ultrasonography, computerized tomography, magnetic resonance imaging and lymphoscintigraphy are sufficient and often used for diagnosis and evaluation of these changes. Both hemangiomas and lymphangiomas are slow-growing tumors. Although most of spleen tumors are benign, yet they are incomparably rarer than those located in the liver. They mainly cause symptomatology which occurs as a consequence of pressure on the surrounding structures. There is often undefined pain which can be seen from our presentation. Sometimes lymphangiomas are associated with lymphangiomatosis located in the mediastinum, retroperitoneum, axilla or neck, whereas KTS hemangiomas are often associated with generalized malformations of blood vessels. Lymphangiomas are rarely unilocular or more often, as in this case, made of numerous septated cystic areas [20]. Pathohistologically they are coated with a single row of flattened endothelium containing unstructured eosinophilic content in the lumen, with detached lymphocytes, in contrast to vascular hemangioma areas which consist of blood. Hemangiomas grow as a single tumor or they occur in multiple areas, they can be localized or diffuse lesions, and histologically in a capillary or diffuse form. Usually they are small (1-3 cm in diameter), rarely bigger in diameter, and sporadically enormous in size. Complications are spleen rupture, hypersplenism and malignant transformation [21].

It is difficult to predict the outcome of hemangiomas in solid organs. Prognosis is mostly good, but there is always a risk of rupture due to minor trauma. Changes in diameter larger than 4 cm indicate increased susceptibility to rupture (with incidence of 25%) and can lead to fatal bleeding [22, 23]. In adult patients ruptures or other complications have not been recorded due to monitoring and applied conservative methods. [24] Given that in our patient spleen hemangioma was larger than 4 cm and that

she had symptoms such as pain in the left hypochondrium, splenectomy was absolutely indicated.

It should be kept in mind that in patients with KTS, although extremely rare, there is a possibility of systemic manifestations usually in the form of generalized angiomatosis, which requires detailed diagnostic tests in order to timely detect any changes in the internal organs and start with treatment and prevention of complications, which can be fatal for a patient.

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Комбиновани лимфангиом и хемангиом слезине код болеснице с Клипел–Тренонеовим синдромом

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КРАТАК САДРЖАЈ

Увод Клипел–Тренонеов (*Klippel-Trénaunay*) синдром (КТС) је врло ретка урођена аномалија крвних судова коју одликује следеће клиничко тројство: проширене површинске вене, малформације капилара коже и обично једнострана хипертрофија коштаног и меког ткива екстремитета (најчешће на доњим екстремитетима). Често је праћен висцералним манифестацијама, а само ретко је удружен са спленомегалијом.

Приказ болесника Болесница стара 30 година јавила се на Клинику за хирургију због повремених болова у левом хипохондријуму трбуха. Постављена је дијагноза КТС удруженог са спленомегалијом, након чега је урађена спленек-

томија. Макроскопски и микроскопски преглед слезине указали су на тумор васкуларног порекла, на комбинацију лимфангиома и хемангиома.

Закључак Дијагностикован КТС захтева детаљна клиничка испитивања болесника због могућности постојања висцералних манифестација. Уколико постоји спленомегалија, иако је она најчешће бенигне природе, спленектомија се обично врши да ублажи пратеће симптоме који настају услед увећања органа и компресије, да спречи руптуру и последично крварење када је васкуларни тумор слезине великих димензија, те да би се избегла могућност малигне трансформације.

Кључне речи: Клипел–Тренонеов синдром; спленомегалија; хемангиом; лимфангиом

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