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Successful thrombolysis during acute limb ischemia in a child with nephrotic syndrome

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Abstract
Thromboembolic complications are frequent in the nephrotic syndrome. Arterial localizations have been rarely reported. There is no consensus on their management; it depends on the location and hypercoagulable state. We report a case of acute upper limb ischemia occurring in a child with a history of nephrotic syndrome. The diagnosis was made by Doppler ultrasonography. Thrombolysis was performed because of the impossibility of a thrombectomy with an anticoagulant treatment with a great evolution

Keywords: child, nephrotic syndrome, arterial thrombosis, thrombolysis

Introduction
Nephrotic syndrome (NS) is a common pathology in pediatrics, which is characterized by the frequency of thromboembolic complications. Although venous thromboembolic complications are most common, arterial thrombosis may be life-threatening.

Case report
Informed consent was obtained from the patient's parents before presenting the report.
A 5-year-old boy with a history of corticosensitive NS under corticosteroid therapy presented to the pediatric nephrology department of Charles Nicolle hospital with complaints of insomnia pain of the right upper limb associated with heaviness and tingling in the same side evolving for 36 hours.
Interview with parents revealed the notion of hospitalization a week ago for a relapse of nephrotic syndrome.
On examination, the child was conscious and cooperative, he was afebrile with a pulse rate of 86/min and blood pressure of 90/50 mmHg in the left arm. Examination of the right upper limb showed a livid, cold, and pale member. The radial, ulnar and humeral pulse were not noticeable. All associated with a decrease in motor skills and sensitivity of the same limb, other pulses were present. Urine analysis showed 3-cross proteinuria and 3-cross hematuria. Doppler's ultrasonography showed thrombosis of the right humeral artery at the level of its lower third with absence of visualization of the right ulnar and radial arteries. Infiltration and hypertrophy of the soft tissues of the right forearm. The morphological ultrasound study finds a permeable venous axis on both sides. Biological investigations showed a hemoglobin level at 14.5 g/dl, the total leukocyte count was 25980/mm3 with a normal platelets count (platelets: 465000/ mm^3). The serum creatinine level was 31 µmol/l, Electrolytes and coagulation parameters were normal. Serum protein electrophoresis test showed hypoproteinemia and hypoalbumenia at respectively 41 and 17 g/dl. Proteinuria was 125 mg/Kg/d. The diagnosis of upper limb ischemia related to thrombosis of the right humeral artery secondary to relapse of NS has been made. Treatment with unfractionated heparin at a dose of 20UI / Kg / h was started, a thrombectomy was discussed but not retained because of the duration of evolution of symptoms. A thrombolysis was decided, after eliminating the contraindications, the patient received a bolus of Tenecte Plase at a dose of 1.5 mg / kg over 30 minutes without incidents. The evolution was marked by a gradual improvement of the local state of the right upper limb with Doppler ultrasound of control at the 7^{th} day of evolution a complete repealing of the humeral artery. The relay was then made by vitamin k antagonists with INR ratio monitoring. For his NS, the child was put back under corticosteroids at the dose of 60 mg/m^2/d then a relay by Mycophenolate mofetil was made.

Discussion
Thromboembolic disease is an important complication in patients with NS, Thrombosis results from intravascular blood coagulation leading to thrombus formation that obstructs blood flow [1, 3]. As seen in the present case, nephrotic patients are having the risk for developed thromboembolic complications. Several thromboembolic complications have been reported in children with NS in the literature. Thrombosis in NS is associated with a hypercoagulable state arising from alteration in blood levels of various factors involved in coagulation and fibrinolytic system, alteration in platelet functions, increased blood viscosity due to hemoconcentration, elevated blood pressure, and probably administration of steroids and/or diuretics [4, 6]. Thromboembolic events occur most often during a flare during the first year of nephrotic syndrome, but may also occur after prolonged evolution [7].
For our patient, the thromboembolic event occurred after 1 year and a half of evolution of the disease. The corticoresistance of the nephrotic syndrome multiplies again by 2, 5 the risk of thrombosis [8]. Arterial thrombosis are less well known because of the lower frequency compared with venous thrombosis. The most common arterial sites of thrombosis are femoral arteries, other sites such as humeral artery have been rarely reported [9].
There is no consensus for anticoagulant treatment modalities

during a thromboembolic event. The treatment depends on the localization and hypercoagulability, but usually high-dose heparin therapy, is initiated initially because the anticoagulant activity of heparin is independent of antithrombin III. Initial treatment uses unfractionated heparin at therapeutic doses (Grade 1B recommendation) or low molecular weight heparin (Grade 2C recommendation). Therapeutic anticoagulation is continued for 5 to 7 days (LMWH or unfractionated heparin) [10]. To our knowledge thrombolysis has never been used in arterial thrombosis in children with nephrotic syndrome.

The best treatment remains preventive respecting the following measures:

- Prohibit prolonged rest and the puncture of deep vessels
- Correction of hypovolemia
- Limit the use of diuretics

Some studies suggest prophylactic anticoagulation in patients with NS with additional risks for thrombosis like steroid therapy or very low plasma albumin [11].

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