

## ***Deep venous thrombosis of the left lower limb complicating a fracture of the pelvic at a 10-year-old teenager.***

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**ABSTRACT:** Venous thrombosis is a partial or complete venous obstruction.

It is caused by an endoluminal thrombus. Its localization is possible at any level of the vascular tree though with a predominance in the lower limbs [1]. There are few recommendations regarding prevention of venous thrombosis in pediatric patients. Thus, when prophylaxis' indication is considered -in this type of population-, the therapeutic pattern is then frequently extrapolated from those of adults.

We report here a case of deep vein thrombosis extended from the external iliac vein to the superficial femoral vein, complicating undisplaced fracture of the left ischiopubic branch among a 10-year-old girl. The purpose of this paper is to highlight the need of recommendations regarding venous anti-thrombotic prophylaxis and treatment practices for pediatric population. Also to identify venous thrombotic risk groups in patients of <18 years old.

**Keywords:** Deep venous Thrombosis, Lower limb, teenager." et non "spontaneous rupture of the oesophagus, septic shock, mediastinitis.

### **Introduction**

Venous thrombosis is a partial or complete venous obstruction caused by an endoluminal thrombus. Its localization is possible at any level of the vascular tree though with a predominance in the lower limbs [1]. There are few recommendations regarding prevention of venous thrombosis in pediatric patients. Thus, when prophylaxis' indication is considered -in pediatric population-, the therapeutic pattern is then frequently extrapolated from those of adults.

We report here a case of deep vein thrombosis extended from the external iliac vein to the superficial femoral vein, complicating undisplaced fracture of the left ischiopubic branch among a 10-year-old girl.

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### Clinical presentation

This is a 10-year-old girl, weighting 40 kg, having no underlying contributory medical condition, brought to consultation by her parents for an awful left hip pain with lameness when walking.

First symptoms started 4 days before her admission to the hospital complex of Essos and the beginning of her medical history was marked by a fall of the stairs. It followed a left hip pain first of moderate intensity, concealed by the child, then severe with lameness when walk. The mechanism of the accident remains unclarified. The physical examination found pain in the left inguinal area with limitation of rotational and abduction movements of the left coxo-femoral joint. Patient's general condition was preserved and fever was absent. Left hip radiography performed in ambulatory showed an intra-articular effusion of minimal abundance that could suggest arthritis of the left hip. The Pelvic CT Scan showed a non-displaced fracture of the left ischio-pubic branch. The orthopaedic surgeon opted for a conservative treatment and bed rest during 30 days, in order to favor the formation of bone callus. The evolution at the 7th post-traumatic day was marked by a sudden volume increase of the thigh left and the leg left (Figure 1) with decrease of the calf's sloshing -calf muscle's focal induration -, a fever at 38 C°, a hacking cough and signs of Acute respiratory distress. These signs were strongly suggestive of pulmonary embolism complicating deep vein thrombosis of the lower left limb. Laboratory exams showed a D-dimers at 12 959 ng / l. The infectious laboratory exam was normal. The Doppler Ultrasound venous of lower limbs found a heterogeneous tissular material that obstructed the left external iliac vein.

The obstruction extended to the 1/3 medium of the homolatéral superficial femoral vein.

An aval dilatation was observed (Figure 2 and 3). HoweverThe thoracic angio-scanner did not showed any signs of a pulmonary embolism.

An Anticoagulant treatment based on Enoxaparin associated with Acénocoumarol was initiated. The evolution was favorable after 10 days of anticoagulant treatment (Figure 4). Discharge for the pediatric ward was allowed the 12th day of treatment under Acénocoumarol at the posology of 1 mg/d orally.

Thrombotic events are much rarer in children (Table 1) than in adults [1,2,3].

The impact of venous thromboembolic events isn't accurately defined at the children [4,5].

The impact of the illness, except neonatal thrombosis and cerebral thrombosis, is in the order of 0.7 for 100 000 children that is 5.3 for 10 000 hospitalizations [4].

The relatively low incidence of venous thromboembolic events in children could be explained by thus three main factors. This reduced ability to produce thrombin is caused by, -among other things-, a high level of alpha-2- macroglobulin, a thrombin inhibitor [4, 5, 6].

Secondly, diseases that harm the endothelium vascular, such as diabetes, dyslipidemia and high blood pressure, are less frequent in children than adults [5,6].

Thirdly, children are less exposed to multiple acquired prothrombotic risk factors than adults, such as oral contraceptives, hormone replacement therapy, pregnancy, postpartum delivery, and smoking [5, 6].

Risk factors that expose to a venous thromboembolic event in children are essentially: the factors of congenital prothrombic risks (deficit of antithrombin, protein C or protein S, the mutation of the factor V Leiden, the mutation G20210A of the gene of the prothrombin, a hyper-homocysteinemia and an increase of the lipoprotein a); and acquired risk factors (the central venous catheters, infections, surgical operations, traumatism, the nephrotic syndrome, lupus and cancer) [5, 6, 7].

In our observation, we raise two major facts: The pelvic fracture require an immobilization because of the intensity of the pain and the objectives of the consolidation. Among adults patients, its management require a prevention of venous thromboembolic disease without delay. The absence of consensus and recommendations strategy concerning venous thrombotic prevention, probably drove pediatric 's medical team often to a therapeutic abstention. The evolution was marked by a rare event: the formation of a deep venous thrombosis of the lower limb.

It should be noted, among child patients, diagnosis of thromboembolic illness remain difficult to made.

Reasons of that is the absence of specifics guide lines for pediatric population.

To date, there are no prospective studies that have validated exclusion criteria for the diagnosis of deep vein thrombosis in the case of negative results of Doppler ultrasound. The same observation could be made about D-dimer rate.

The management of Deep Vein Thrombosis of the Left Lower Limb in our patient was based on the therapeutic model of an adult.

Under treatment patient evolved favorably. However, difficulties were due to the doses' adjustment of low molecular weight heparine (Enoxaparine) and the anti-vitamin K (Acénocoumarol). No adaptation of commercialized anticoagulant drugs dosage is possible because of thier comercialised galinic presentation.

Low molecular weight heparines became the first choice of anticoagulant agents in prophylaxis and treatment of deep venous thrombosis in several paediatrics centers despite with the absence of studies concerning the effectiveness of these drugs on this population [6].

The other difficulty remains the impossibility of predicting the effectiveness of anticoagulant therapies in the absence of "guidelines" for pediatric populations.

Pediatric therapeutic doses of low molecular weight heparin have been extrapolated from that recommended for adults. They are based on a range of anti-Xa activity values that is established for each type of low molecular weight heparin and dosed 4-6 hours after the last injection. The low molecular weight heparin doses to be used in adolescents and required to achieve the established adult target anti-Xa value were determined for enoxaparin, reviparin, dalteparin and tinzaparin. For adolescents, these doses are similar to those recommended for adults [6, 7]. For an identical INR, the children's plasma under AVK has a capacity to generate thrombin that is 25% lower than that of adults [6,7]. Thus, this suggests that the optimal INR in children may be lower than that usually recommended in adults.

Nevertheless, there never has been a study that evaluated the ideal INR in pediatric patients.

### **Conclusion**

Venous thromboembolic events among pediatric population remain to this day a medical curiosity whose outcome can be fatal.

The improving intensive care exposes increasingly young population to venous thromboembolic events. The pediatric particularities, improvement knowledge of the pathophysiology of venous thromboembolic disease and better knowledge of the anticoagulant pharmacology should encourage experts to develop guidelines for the identification of risk factors and therapeutic management.

### Conflicts of interests

The authors declare no conflict of interests.

### Contributions of the authors

All authors contributed to the realisation of typescript.

All authors contributed to the behaviour of this job.

All authors also declare to have read and approved the finished version of the typescript.

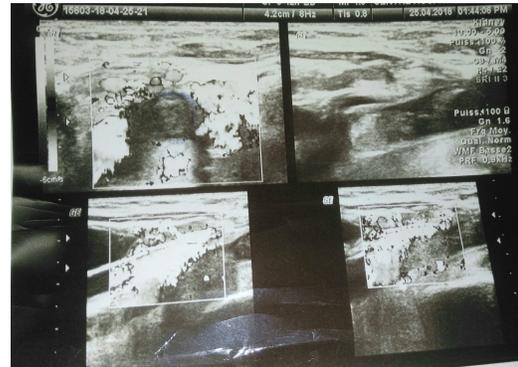
### Conflict of interest

The authors declare no conflict of interest.

**Figure 1:** Aspect of big left lower limb in the 7th day post-traumatism of the pelvic.



**Figure 2:** Aspect of heterogeneous tissular material with obstruction of the left external



**Figure 3:** Distension ultrasound aspect of the left external iliac vein before the obstruction. (arrow)iliac.



**Figure 4:** Aspect of the left lower limb in the 10th day of anticoagulant treatment



<b>Register</b>	<b>Year</b>	<b>Period</b>	<b>Impact</b>
Canadian registry	0 – 1 month	1990 - 1993	2.4/1000 admission to neonatology
	1 month – 18 years	1990 - 1992	0.07/10000 children
German registry	0 – 1 month	1992 - 1994	0.51/10000 children
Dutch paediatric surveillance unit	0 – 1 month	1997 - 1998	14.5/10000 newborns
	0 – 18 years	1997 - 1998	0.14/10000 newborns
US national Hospital Discharge Survey	0 – 1 month	1979 - 2001	1.50/10000 newborns
	0 – 17 years	1979 - 2001	0.49/10000 newborns
British paediatric surveillance survey	1 month – 16 years	2001 - 2003	0.07/10000 newborns
<b>Table 1: Impact of thromboembolic venous events at the child [2]</b>			

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