How to manage a case of ischial tuberosity avulsion fracture?

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Introduction

Apophyseal avulsion fractures of the pelvis are common among teenage athletes. These comes as a sharp and well-localized pain after a sudden forceful contraction of the muscle attached to an apophysis before the ossification of the growth cartilage. Treatment can be conservative or surgical.

Case report

A sixteen-year-old high-performance athlete presented an avulsion fracture of the ischial tuberosity. The diastasis of the avulsion was 1.9 cm and a conservative approach was chosen. The isokinetic assessment showed an important strength imbalance. Despite the absence of radiological healing, rehabilitation by specific and progressive strengthening enabled to reestablish hamstring strength, with an H/Q mixed ratio increasing from 0.8 to 1.44. The patient restarted competition successfully less than one year after the injury with performance levels which were the same as before the injury.

First X-Ray

Last X-Ray after fonctional recovery

Muscle group and modalities	Healthy side (N.m)	Injured side (N.m)	Deficit	Injured side after rehabilitation (N.m)	Alteration of injured side after rehabilitation
Hamstring					
Conc 60deg/s	123	85	-31%	103	+21%
Conc 240deg/s	91	75	-18%	81	NS
Ecc 30deg/s	152	110	-28%	190	+73%
H/Q ratio					
Conc 60/Conc 60	0,66	0,50		0,58	
Conc 240/Conc 240	0,63	0,54		0,62	
Mixed Ecc30/Conc240	1,06	0,80		1,44	

Discussion

Many publications have discussed the surgical versus the conservative approach to treating ischiatic avulsion. Most of the published literature advocate the relevance of surgery when the diastasis exceeds 2 cm because widely displaced fractures may lead to chronic symptomatology if the treatment remains conservative. Different criteria, such as pain relief, ability to perform in sport, gross strength, activity score, X-Rays, are used by authors to demonstrate the recovery after treatment. No study accurately measured the hamstring strength before and after treatment. However, strength imbalance, especially as regards the H/Q mixed ratio, significantly increases the risk of sustaining hamstring injury in soccer player. We advocate that radiological assessment should not be the main recovery criterion and that specifically adapted strengthening should be started even when the avulsion persists on the X-Ray. Furthermore, hamstring strength should be measured accurately and objectively, e.g. by isokinetic dynamometry, to be one of the main return to play criterion in association with clinical data.