

## **CASE SERIES: ABDOMINAL MUSCLE INJURIES IN ATHLETES.**

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### **2008 Leonard Schroeder Award for Best Original Research**

**Objective:** An abdominal muscle injury, commonly known as “the sports hernia” has become more prevalent over the last 15 years. This injury is most commonly seen in hockey and soccer and least commonly seen in track and field and football. This investigation is designed to assess the characteristics of patients presenting to an office with this injury and determine the most effective methods to diagnose the injury.

**Methods:** A retrospective analysis of diagnosed cases of rectus abdominus strains who presented to an office over a 17-year period were categorized by sex, age, sport, time to diagnosis, clinical exam, and case management. Inclusion criteria are lower abdominal pain associated physical activity or sports, lower abdominal and medial thigh pain associated with physical activity or sports, reproduction of symptoms through physical examination, and case management. Inguinal hernia only patients, and hip adductor strain only patients were excluded.

**Results:** There were 51 cases that met the inclusion criteria of lower abdominal pain associated physical activity or sports, lower abdominal and medial thigh pain associated with physical activity or sports, reproduction of symptoms through physical examination, and case management. There were 49 males (96.0%) and 2 females (4.0%). The mean age was 27.2 years with an age range of 19-34 years. The sport breakdown was: hockey (n=34, 66.7%), soccer (n=10, 19.6%), basketball (n=3, 5.9%), weightlifting (n=1, 2.0%), marathon (n=1, 2.0%), and recreational athletes (n=2, 3.9%). The mean time to diagnosis was 8.9 months with a range from 2 weeks to 36 months. The physical examination included several tests: a test described by Davidson in which the doctor depresses the inferior rectus abdominus muscle with his/her thumbs and the patient then performs a sit-up while observing for asymmetry of displacement of the doctor’s thumbs. 100% of the cases presented with asymmetry during Davidson’s sit-up test. A traditional sit-up against resistance provided by the doctor elicited abdominal pain in 91% of the cases. Resisted hip adduction elicited pain in 82% of the cases. A resisted sit-up in rotation elicited ipsilateral pain. 26 patients had an MR scan of the injury. The tear was visualized on MRI in 2 cases. The lower rectus abdominus tears were directly visualized upon external surgical repair. The tear occurred near the inguinal ring extending superiorly into the rectus abdominus muscle.

**Outcome:** 46 patients (90.2%) underwent surgical repair (external or laparoscopic). 43 patients (93.5%) had excellent outcomes and returned to competition in six weeks. One external repair and one laparoscopic repair required a second surgical repair. One patient had an external repair and a bilateral partial adductor release and required five additional weeks to return to play. Five cases elected to not have surgery. Three resolved after one year and multiple exacerbations during the year. Two patients are early in the waiting period and are too soon to know the outcome. One of these waiting cases also has a pelvic stress fracture. Of interest, 8 patients waited an entire season and still required surgical repair. Popular core stability exercises failed to improve the symptoms in all but one case, but this required one year. The two cases also requiring one year did not perform these popular exercises. Five cases were able to complete their season with symptoms.

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