

SHORT REPORT

Rectus sheath haematoma: a rare presentation of non-contact strenuous exercises

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Rectus sheath haematoma (RSH) is a well-documented but uncommon clinical condition. It is usually a self-limiting condition but can present as a life-threatening emergency. RSH after non-contact vigorous exercise is unknown. Two such cases secondary to yoga and laughter therapy sessions, respectively, are reported. One of them required surgical intervention, whereas the other was successfully treated conservatively.

Rectus sheath haematoma (RSH) is an uncommon but well-documented clinical entity.^{1,2} It results from haemorrhage into the rectus muscle due to rupture of the superior or inferior epigastric arteries, their branches or a tear of the rectus abdominis muscle.^{1,3} It is a known complication of abdominal trauma and anticoagulation.^{1–7} Other rare associations include exertion, pregnancy, insulin injection, paroxysmal coughing and abdominal surgery.^{2,4,5} RSH is often misdiagnosed and can mimic various intra-abdominal diseases.^{3,4,6} Although it is generally self-limiting, it can cause life-threatening clinical conditions such as hypovolaemic shock, leading to morbidity and mortality.^{1,3,7} Abdominal wall injuries are rarely reported but more often perceived by sports medicine practitioners.⁸ We present two unique non-contact sport-related presentations of RSH, one after yoga and the other as a consequence of laughter therapy exercises. RSH secondary to these conditions has not been reported in the English literature to our knowledge.

CASE REPORTS

Case 1

A 61-year-old woman presented to the accident and emergency department with severe, lower abdominal pain and abdominal distension. She had attended a *pranayama* session of a yoga course nearly 6 hours before and had to stop in between owing to abdominal discomfort. She had a past history of hypertension and was taking bendrofluzide and aspirin. On admission she was hypotensive with a blood pressure of 84/46 mm Hg, and tachycardic with a heart rate of 128 beats/min. The ECG showed sinus tachycardia. She was actively resuscitated with intravenous crystalloids, catheterised and given adequate analgesia. Abdominal examination disclosed generalised peritonitis and a smooth tender mass over the left iliac fossa extending up to the midline (fig 1). Routine blood tests showed low haemoglobin 84 g/l. Her clotting test, however, showed a slightly raised international normalised ratio of 1.6 and activated partial thromboplastin time of 32 seconds. She was transfused with 2 units of whole blood and an urgent CT scan of the abdomen was performed. This showed an RSH 10×12×8 cm in size over the left lower quadrant of the abdomen (fig 2). Despite blood transfusion, her blood pressure dropped further and therefore an emergency surgical exploration was undertaken. A large RSH consisting of about 750 ml of dark blood with clots was drained and the actively bleeding left

inferior epigastric artery was ligated. The patient recovered well and was discharged home on the fourth postoperative day.

Case 2

A 67-year-old woman presented to the accident and emergency department with gradually worsening pain in the left lower quadrant over the past 3 days. She had been attending laughter therapy sessions for the past month after reading about it in a



Figure 1 Abdominal distension in case 1.



Figure 2 CT scan of abdomen in case 1 showing a rectus sheath haematoma.



Figure 3 CT scan of abdomen in case 2 showing rectus sheath haematoma.

health and sport magazine. The last session was 3 days before developing niggling pain over the left lower quadrant. She was otherwise healthy and was taking prophylactic aspirin prescribed by her family physician. At presentation, her blood pressure was 128/76 mm Hg and her heart rate 86 beats/min. Abdominal examination disclosed an ill-defined tender mass in the left iliac fossa with localised peritonism. All her routine blood tests were normal. A CT scan of the abdomen showed an RSH of 10×6×5 cm size (fig 3). Because the patient was stable, she was treated with analgesia and was discharged home. Subsequent review in the outpatient clinic showed complete resolution of her left lower quadrant mass.

DISCUSSION

RSH is more common in women,¹ probably owing to lean rectus muscle mass in comparison with men. This leads to a greater likelihood of bleeding in response to trivial abdominal wall trauma. Anticoagulation and trauma are the two most common



Figure 4 Pranayama technique of yoga.

What is already known on this topic

- It is an uncommon cause of abdominal pain which is often misdiagnosed
- It occurs because of bleeding into the rectus sheath from damage to the superior or inferior epigastric arteries or their branches or from rectus muscle tear.
- A number of risk factors have been identified and include anticoagulant treatment, vigorous coughing, contact sports, pregnancy, abdominal surgery, abdominal wall trauma, vigorous rectus muscle contractions, and certain medical conditions such as leukaemia and blood disorders.
- Ultrasound scan and CT are the two best imaging modalities for an accurate diagnosis.
- The patient's clinical condition determines the type of treatment. For a haemodynamically stable patient, treatment of the primary cause together with conservative management is appropriate. Emergency radiologically guided embolisation or surgery is reserved for those patients who are haemodynamically unstable and unresponsive to initial fluid resuscitation.

What this study adds

- Both of our cases occurred in patients taking part in non-contact sports activities—yoga and laughter therapy—which has not been described previously.
- Aspirin treatment might have predisposed our patients to this uncommon condition.

predisposing factors in its development.¹⁻⁷ None of the patients in the present report were receiving anticoagulants and their clotting profile was normal. However, both these patients were taking a small dose of aspirin, which might have aggravated bleeding because of platelet dysfunction.

Severe abdominal wall injury due to strenuous exercises is rare.⁸ *Pranayama* is a special exercise in yoga. It is done with continuous actions of inhaling and exhaling air, keeping the abdomen taut and relaxed alternately⁹ (fig 4). Laughter therapy sessions involve forced laughing for abdominal exercise and stress management. Forced laughing raises transdiaphragmatic pressure¹⁰ and as a result there is an increase in abdominal pressure. Thus the plausible explanation for RSH in the present report is vigorous abdominal contractions in *Pranayama* and laughter therapy exercises.

Abdominal pain and abdominal mass not only occur in RSH but also in numerous intra-abdominal emergencies. RSH is therefore often misdiagnosed.¹⁻⁷ The absence of any pathognomonic features renders imaging modalities as the sole non-invasive alternative for the diagnosis of this condition. Although ultrasound, CT and magnetic resonance imaging of the abdomen have been used for diagnosis of RSH, a CT scan is the preferred radiological modality.^{1 4 5 7} Both our patients were correctly diagnosed with a CT scan. Stable patients should be managed conservatively, but unstable patients will require active resuscitation and surgical control of bleeding if further deterioration occurs.^{1 3}

CONCLUSION

Strenuous abdominal exercises may lead to RSH. Clinicians therefore need to be aware of this complication after

non-contact strenuous exercises such as yoga and laughter exercises. The clinical condition of the patient dictates the approach to treatment: conservative or surgical.

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REFERENCES

- 1 **Cherry WB**, Mueller PS. Rectus sheath hematoma: review of 126 cases at a single institution. *Medicine (Baltimore)* 2006;**85**:105–10.
- 2 **Maharaj D**, Ramdass M, Teelucksingh S, et al. Rectus sheath haematoma: a new set of diagnostic features. *Postgrad Med J* 2002;**78**:755–66.
- 3 **Linhares MM**, Lopes Filho GJ, Bruna PC, et al. Spontaneous hematoma of the rectus abdominis sheath: a review of 177 cases with report of 7 personal cases. *Int Surg* 1999;**84**:251–7.
- 4 **Buckingham R**, Dwerryhouse S, Roe A. Rectus sheath haematoma mimicking splenic enlargement. *J R Soc Med* 1995;**88**:334–5.
- 5 **Zainea GG**, Jordan F. Rectus sheath hematomas: their pathogenesis, diagnosis, and management. *Am Surg* 1988;**54**:630–3.
- 6 **Dineen RA**, Lewis NR, Altaf N. Small bowel infarction complicating rectus sheath haematoma in an anticoagulated patient. *Med Sci Monit* 2005;**11**:57–9.
- 7 **James RF**. Rectus sheath haematoma. *Lancet* 2005;**365**:1824.
- 8 **Johnson R**. Abdominal wall injuries: rectus abdominis strains, oblique strains, rectus sheath hematoma. *Curr Sports Med Rep* 2006;**5**:99–103.
- 9 **Johnson DB**, Tierney MJ, Sadighi PJ. Kapalabhati pranayama: breath of fire or cause of pneumothorax? A case report. *Chest* 2004;**125**:1951–2.
- 10 **Filippelli M**, Pellegrino R, Landelli I, et al. Respiratory dynamics during laughter. *J Appl Physiol* 2001;**90**:1441–6.

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