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Chiropractic management of abdominal aortic aneurysm: a case report

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Aortic dilatation is a common and potentially life-threatening condition with which a patient may present to the chiropractor. It is most often detected in males over 50, particularly in association with hypertensive disease. This case illustrates the classic clinical and radiologic features of a large (13cms) abdominal aortic aneurysm. The manipulative management of patients with abdominal aortic aneurysm is discussed.
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KEY WORDS: abdominal aortic aneurysm, chiropractic, manipulation.

Un patient peut se présenter à un chiropraticien avec une dilatation aortique, état courant qui peut mettre la vie en danger. Il est habituellement diagnostiqué chez des hommes de plus de 50 ans, et il est particulièrement associé à une pathologie d' hypertension. Ce cas illustre les caractéristiques cliniques et radiologiques classiques avec un anévrisme abdominal important (13 cm). La manipulation des patients souffrant d' anévrisme aortique abdominal est discutée.
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MOTS CLÉS : anévrisme aortique abdominal, chiropraxie, manipulation.

Introduction

The abdominal aortic aneurysm (AAA) is defined as a localised dilatation of the aortic wall of greater than 3 cms in diameter.[1] It is commonly secondary to atherosclerotic weakening of the vessel wall. A common life-threatening condition, AAA rupture causes 2% of all deaths of men aged 65 to 74 years in the United Kingdom.[2] Patients with AAA are more commonly asymptomatic but can have associated back pain. Therefore, detection is important both to ensure appropriate long-term management and in order to modify spinal manipulative therapy in cases of associated mechanical low back pain.

This case demonstrates the classic presentation of an AAA and the need for urgent referral. The essential clinical and radiographic features are reviewed in conjunction with principles of management, particularly the use of manipulative procedures on patients with AAA.

Case Report

A 69-year-old retired airline pilot presented with dull low lumbar pain radiating into both groin regions and into the scrotum. The reported onset followed a "bout of the flu" two months earlier.

Sitting aggravated the pain. However, no alleviating factors were reported. The pain was severe enough to keep him awake at night and he reported only two to three hours of sleep for three nights prior to presentation. He had been constipated for four days and has had a three year history of urinary frequency. His previous history included a myocardial infarction in 1974 and hypertension, for which he was receiving medication. He had consulted his GP for his low back pain and constipation, for which he received pain medication and laxatives.

On examination, the vital signs were within normal limits. Blood pressure was 140/95. Abdominal examination revealed uniform tenderness over the right lower quadrant with mild abdominal distension. No palpable mass was detected. The patient was posturally erect with no antalgia. Left lumbar rotation produced pain over the right sacroiliac joint at the end range. Yeoman's test, sacroiliac compression and palpation also produced pain over the right sacroiliac joint. Neurological examination was normal. Radiographs of his lumbopelvic spine revealed a curvilinear calcific density associated with a large mid-line soft tissue mass (Figure 1). This represented an AAA which measured 13 cms in diameter.

The patient was referred immediately for urgent surgical review and underwent successful surgical repair of his abdominal aorta that evening.

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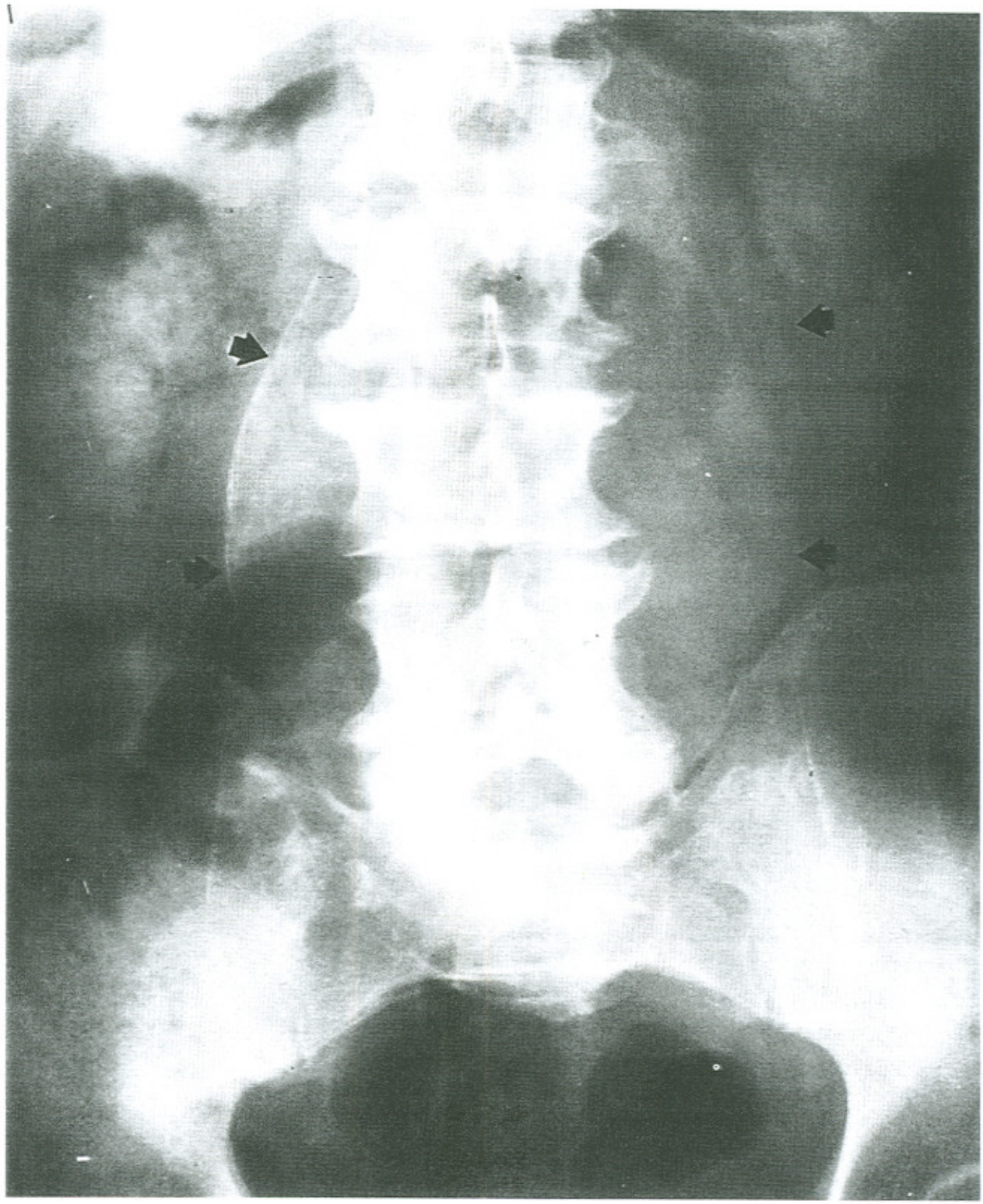

Figure 1(a) Antero-posterior lumbar spine. Note the rim-like calcification outlining the outermost margins of the dilated vessel bilaterally.

Figure 1(b) Lateral lumbar spine. Note the anterior expansion of the anterior abdominal aortic wall.

Discussion

Abdominal aortic aneurysm is defined as a localised dilatation of the aortic wall of greater than 3cms in diameter.[1] It is most commonly located between the renal arteries and the iliac bifurcation anterior to the 2nd–4th lumbar vertebrae[3] and often involves the aortic bifurcation and the common iliac arteries.[4] Weakening of the aortic wall is most often secondary to atherosclerotic change, particularly when combined with hypertension. Other causes include trauma, infection, syphilis, cystic medial sclerosis and Marfan's syndrome.[5] However, aneurysm secondary to inflammation of the aorta is a condition complicated by fibrosis and thickening of the aortic wall and can present problems for surgical correction when compared to an uncomplicated atherosclerotic aneurysm.[1]

The incidence of AAA appears to be increasing,[5] with prevalence currently estimated at approximately 3%.[6] Whilst it is a significant cause of death in males between 65 and 74 years of age, death is rare before the age of 55. However, incidence doubles with every decade after 55 years of age, particularly in male hypertensives.[2]

The normal diameter of the abdominal aorta measures 2–3 cms, being slightly larger proximally.[7] An AAA with a diameter of 3.8 cms, as measured on a lateral radiograph, is defined as a clinical aneurysm.[3] Darling,[7] in reviewing 282 cases of ruptured AAA on autopsy, reported that 18% measuring less than 5 cms, 60% measuring less than 10 cms and 95% of the aneurysms greater than 10 cms, had ruptured. Those in excess of 5 cms in diameter tend to progress rapidly and have an increased rate of rupture. Elective surgical repair is usually recommended for aneurysms of this size.[2]

Small aneurysms are also known to rupture, particularly if significant enlargement is noted on sequential studies.[1] Murie[5] reports that approximately 10% of ruptures occur with aortic dilatations of less than 5 cms in diameter, whilst abdominal aortic aneurysms of greater than 6 cms have a 76% rate of rupture.[3]

A gradual increase in aneurysmal size is noted with age, growing at approximately 0.5 cms per year.[8] The majority of patients with AAA are usually asymptomatic until rupture occurs.[9] However, 25-30% of patients are symptomatic and commonly present with back and/or abdominal pain.[4] The symptomatic picture can often be that of mechanical low back pain and can, in some cases, mimic lumbosacral radiculopathy.[10] Indeed, Rebbeck, Stiller and Pfitzner[11] reported on 9 of 20 patients with AAA who described pre-operative symptoms which were indistinguishable from mechanical low back pain. The remaining 11 did not report low back pain. The symptomatic picture included sudden onset of pain with no precipitating factors.

Often the pain is characterised as a deep, dull ache with intermittent sharp radiation into the buttock or groin of varying intensity. This pain can be related to pressure and displacement of the splanchnic nerves, coeliac plexus and/or lumbar nerve roots. Moreover, pressure from aneurysmal dilatation can affect other structures, such as ureters and vertebral bodies, thus complicating the clinical presentation. However, as in this case, the pain pattern and/or objective spinal orthopaedic examination often does not indicate any unusual condition in patients with AAA.[11]

The classic clinical triad associated with rupture of AAAs includes sudden severe back or abdominal pain, a tender pulsatile abdominal mass and hypotension. These signs indicate leakage and/or impending rupture which requires urgent surgical referral. However, this triad is often absent.[12] Acute aortic dissection can also occur in the abdominal aorta but more commonly in the ascending or thoracic aorta. Ureteric colic, pancreatitis, perforated duodenal ulcer, diverticulitis, cholecystitis and mesenteric ischaemia are other differential diagnoses which should be considered.

Accuracy of physical examination findings in patients with AAA has been reported to be as high as 80%.[4,15] The expansile pulsatile mass is best palpated between the xiphisternum and umbilicus, slightly to the left of the mid-line. Both aortic walls should be identified and felt to pulsate laterally. This abdominal pulsatile mass is often tender and Darling[7] notes that aneurysmal tenderness is the single most consistent sign of an active or pending leak. Furthermore, back pain can commonly be reproduced by gentle pressure on the aneurysm itself.[7] In the described case, the abdomen was tender to palpation but no pulsatile mass was noted.

Radiological features include a curvilinear rim-like calcification, often of a stippled nature, which can be observed in approximately 55% of the cases.[3,15] It is noted most frequently to the left of the spine from L2 through to L4.

Film quality, with adequate detail and contrast, is important in visualising the AAA.[3] Stites & Canterbury[14] suggest using a larger lateral film size in high risk groups in order to visualise anterior aortic expansion. Occasionally, AAAs erode the anterior lumbar vertebral bodies, producing so-called Oppenheimer erosions. These erosions are more commonly seen in long-standing aneurysms.[3] In a review of 31 patients with rupture of the AAA, calcification of the aneurysm was noted in 68%, a soft tissue mass in 67% and obliteration of the psoas and quadratus muscle planes in 75% of plain film radiographs.[13]

B-mode diagnostic ultrasound is the method of choice for confirmation and evaluation of AAA and has a reported accuracy rate of 98%.[15] Delin, Ohlsen and Swedenborg[8] reported that the rate of increase in size may correlate better to rupture than the size of the aneurysm itself. As a result, even small aneurysms should be followed with repeated ultrasound examinations. Computerised tomography scanning can provide additional information with respect to size and the presence of an intraluminal thrombus. It is also the technique of choice for post-surgical evaluation.[1]

It is generally accepted that AAAs greater than 5 cms should be treated surgically prior to rupture.[7,9] The mortality associated with emergency surgical repair of ruptured AAAs is approximately 50%,[15,16] the main complications being renal or

cardiac failure, respiratory problems and bowel ischaemia.[16] The mortality of elective surgical repair is now less than 5%.[9] Relative contraindications to surgery include pre-existing cardiovascular or renal disease in association with advancing age.[8,16] As the risk of rupture increases over time, small aneurysms are increasingly being considered for surgical repair.[9] Consequently, these should be regularly monitored, particularly in those patients with relative contraindications to surgery.[8]

Abdominal aortic aneurysms, particularly in excess of 6 cms, are commonly regarded as an absolute contraindication to spinal manipulative therapy.[3] Most aneurysms rupture following acute dissection, however, the exact mechanisms of acute rupture and dissection are unknown. Intimal tears may occur, secondary to shear forces and blood pressure fluctuation. Similarly, acute hypertension can also result in ischaemic weakening of the vessel wall.

With a large and symptomatic AAA, as in the case reported here, spinal manipulative therapy is absolutely contraindicated. However, the use of manipulation is less clear in those patients with a small AAA and associated mechanical low back pain. Due to the prevalence of this condition, and its often asymptomatic nature, it is likely that patients with AAAs are receiving spinal manipulative therapy. However, as 10% of ruptured AAAs are under 5 cms in diameter,[7] it is important to modify manipulative techniques for high risk patients. In patients where manipulative management is warranted, it is important to minimise torsional stress to the lumbar spine. This could produce rapid stretch to the abdominal aorta, which is already weakened and may be adhering to the lumbar spine. Gentle graded mobilisation and manipulation, with a minimum of lumbar rotation, should be the therapeutic choice. Ensuring that the patient exhales during the manipulative thrust will help minimise intra-abdominal pressure. Manipulative techniques which involve direct posterior to anterior thrusting should be avoided, particularly in those patients with large anterior osteophytes.[17]

Conclusion

In conclusion, the abdominal aortic aneurysm is a common, potentially life-threatening condition which can present to the chiropractor. Routine clinical examination of the abdomen and peripheral vascular system, including blood pressure, can often reveal potential AAAs. Screening is particularly important in males over 55 years of age with peripheral vascular disease, coronary artery disease, hypertension and/or a hereditary association with vascular disease.[15]

This case demonstrates the classic presentation of the AAA and the need for urgent referral. Abdominal aortic aneurysms can often present with complaints which mimic musculoskeletal pain or exist in conjunction with mechanical low back pain.

The manipulative management of small AAAs, in association with mechanical low back pain, requires a modification of technique in association with frequent re-assessment of aneurysm size. The chiropractor can play a valuable role in the screening and management of this condition.

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