

Emergency treatment of a salmonella-infected abdominal aortic aneurysm associated with spondylodiscitis



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AIM: To report surgical treatment of a ruptured abdominal aortic aneurysm (AAA) associated with spondylodiscitis due to *Salmonella* in emergency setting.

CASE REPORT: A 69-year-old male with an history of hypertension, presented with a ruptured AAA infected by non-typhoidal *Salmonella* (type H), associated with spondylodiscitis. Patient underwent an emergency operation consisting in surgical debridement of infected tissue and aortic replacement with a prosthetic Dacron graft impregnated with Gentamycine. The postoperative course was uneventful and the patient was discharged at day 20 after the index procedure in good clinical condition. antimicrobial therapy was continued for 8 weeks. A CT scan and nuclear medicine studies performed two months later demonstrated minimal sign of residual aortitis. A CT scan 21 months after the procedure showed complete anatomic resolution of the disease.

CONCLUSIONS: A rare but increasing number of aneurysms as a consequence of *Salmonellosis* can be observed with a high rate of morbidity and mortality, mainly in patients with a concurrent infection of the spine and paravertebral tissue. Combined antimicrobial therapy and one-stage surgical treatment can be associated with good outcome.

KEY WORDS: Abdominal aorta aneurysm, Mycotic aortic aneurysms, *Salmonellosis*, Spondylodiscitis.

Introduction

Although the most common clinical presentation of *Salmonella* infection is gastroenteritis, a rare but increasing number of aneurysms as a consequence of *Salmonellosis* can be observed in clinical setting accounting for 35% of all mycotic aneurysms. These aneurysms

can be associated with a high rate of morbidity and mortality, mainly in patients with a concurrent infection of the spine and paravertebral tissue^{2,3,5,10,11,13}. Therefore an early diagnosis is crucial, leading to prompt combined antimicrobial and surgical management. We present a patient with a rupture of a mycotic abdominal aortic aneurysm infected with *Salmonella* that spread to the adjacent lumbar vertebra, who underwent surgical treatment in emergency setting.

Case report

A 69-year-old male with an history of hypertension, presented with an acute and increasing abdominal pain with

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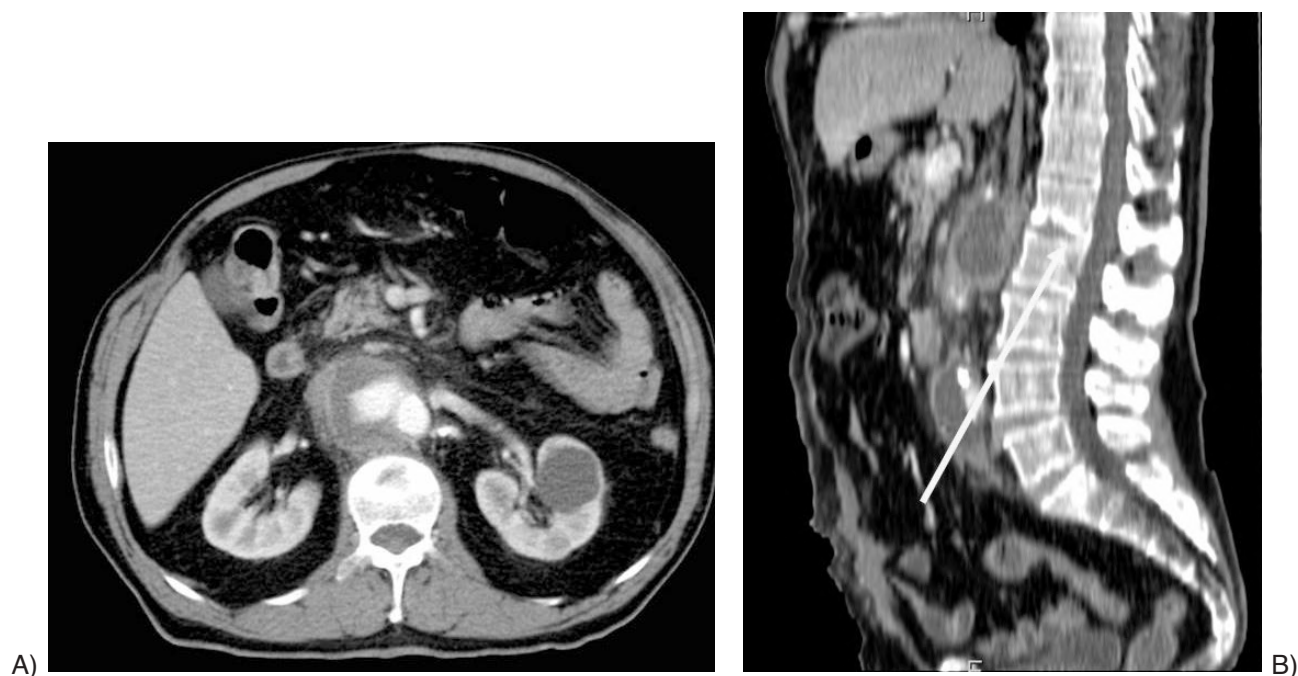


Fig. 1a-b: CT scan, arterial phase, showing an iuxtarenal abdominal aortic aneurysm associated with spondylodiscitis and erosion of L2 vertebral bone (yellow arrow).

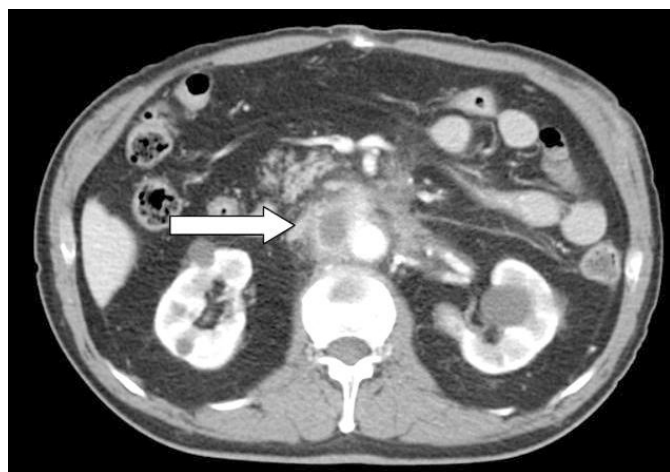


Fig. 2: CT scan showing residual signs of aortic infection 2 months after aortic repair.

radiation to the spine, associated with septic fever ($> 38^{\circ}\text{C}$). The patient was previously evaluated in a primary care institution with a diagnosis of acute spondylodiscitis, but the pharmacological therapy was not effective on clinical course. At the admission in our emergency department one month later, the first clinical examination revealed an abdominal pulsatile mass with systolic bruit. Laboratory investigations demonstrated an increased white cell count ($> 13.000/\text{mmc}$) and high

blood level of alkaline phosphatase (130 U.I./L). A computed tomography (CT) scan showed the presence of an iuxtarenal aneurysm with spondylodiscitis and erosion of the vertebral bones (Fig. 1a-b). Because of poor clinical conditions, an emergency surgical treatment was advocated. At the operation a paraortic saccular false aneurysm was found arising from the lateral wall of the abdominal aorta close to right renal artery. Fluid specimens were collected from the sac for culture. After surgical debridement the affected segment of aorta was replaced with straight Dacron graft impregnated with Sulbactam ampicilline and Gentamycine (Gelsoft Vascutek Terumo, Inchinnan Renfrewshire, UK). The postoperative course was uneventful and the patient was discharged at day 20 after the index procedure in good clinical condition, with a substantial decrease of pain and no signs of infection. The results of intraoperative culture yielded gram-negative bacilli, which were identified as non-typhoidal *Salmonella* (type H). The microorganism was sensitive to Teicoplanine, Meropenem, and Ciprofloxacin and related therapy was continued for 8 weeks. Two months after the procedure, the pain was completely disappeared and CT scan showed residual signs of infection in the aortic region confirmed by scintigraphy using leukocytes marked with 99m-Tc-HMPAO (Fig. 2). A CT scan 21 months after the procedure showed complete anatomic resolution of the disease (Fig. 3), confirmed by the results of blood samples analysis (C-reactive protein, procalcitonine, and erythrocyte sedimentation rate test).

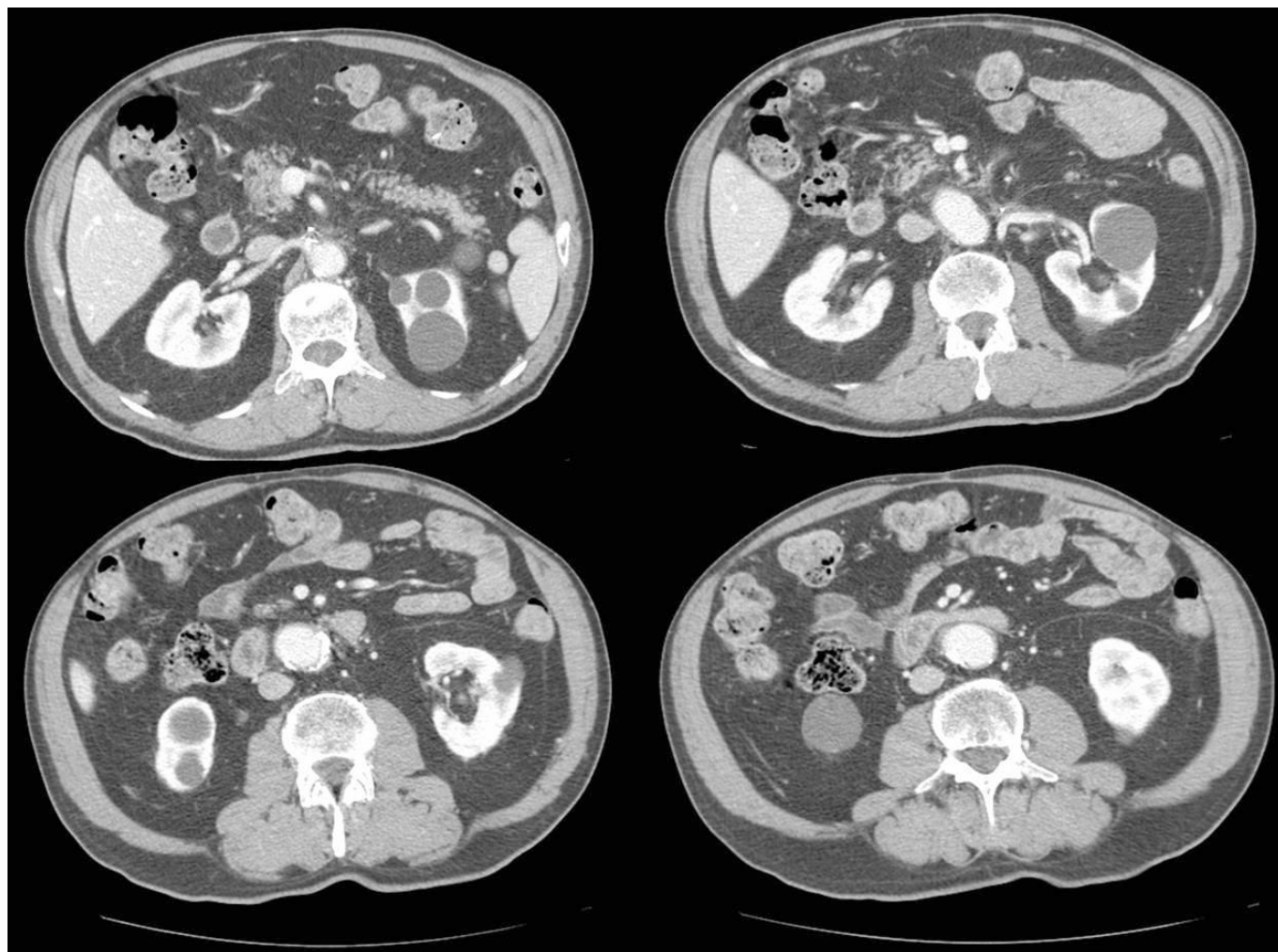


Fig. 3: CT scan, arterial phase, 21 months later graft implantation showing complete anatomic resolution of *Salmonella* aortic infection.

Discussion

The most common clinical presentation of *Salmonella* infection is gastroenteritis which is usually self-limited. Arterial aneurysms may present after *Salmonellosis* as a consequence of particular predilection of this germ for arterial walls and may be associated with a wide variety of *Salmonella* types. The reported risk for endovascular infection in patients with bacteremia due to non-typhoidal *Salmonella* is 23%. Infrarenal abdominal aorta is the most frequent site of *Salmonella* vascular infections followed by the thoracoabdominal tract, accounting for 0.65% of all aortic aneurysms and for 35% of all mycotic aneurysms^{2,3,5,7,11,13}. These aneurysms are characterized by saccular, multilobulate, periaortic soft tissue stranding and irregular peripheral enhancement of arterial walls trend to rapid expansion, and involvement of the vertebral spine^{10,12}.

Rupture is the most common symptom of presentation in patients affected by *Salmonella*-infected aneurysms and

the diagnosis is occasionally made during emergency laparotomies for acute bleeding. However, an increasing number of patients can be observed before rupture with misunderstanding symptoms leading to late diagnosis and poor outcome. According with other reports¹⁰, our patient presented with spondylodiscitis resulting from contiguous spread of *Salmonella* infection from the adjacent abdominal aorta, that was lately recognized requiring an operative treatment in critical conditions. In similar cases a prompt diagnostic suspicion on the basis of clinical examination, laboratory and imaging study enables an early antimicrobial and surgical treatment with a lower mortality rate^{6,8}.

The treatment of *Salmonella* infected aneurysms respects the general principles of surgical management of mycotic aneurysms including complete resection of infected tissue, placement of an axillo-bifemoral bypass or "in situ" prosthetic graft through a clean, non-septic tissue plane, and long-term IV antimicrobial therapy up to 2 months^{3,6,14}. However, because of the frequent involvement of

suprarenal aorta, alternative techniques for open repair of pararenal aortic aneurysms should be performed ¹. The use of endovascular repair in mycotic aneurysms may be attractive providing a good alternative in critical condition, but a word of caution has to be spent concerning the placement of an endoprosthesis in a Salmonella-infected field. An endovascular exclusion should be used as a temporary measure waiting for the identification of infection leading to improve the antimicrobial therapy and a more definite surgical treatment ^{4,8,9}. Regardless the type of surgical management, the perioperative antimicrobial therapy prolonged for at least 4-6 weeks has to be considered as relevant component of clinical approach because Salmonella infection is difficult to eradicate in arterial lesions and new infections can appear long after successful surgical treatment, with a reported mortality rate up to 45% ². In our patient the reported outcome was favourable in spite of an emergency one-stage surgical treatment performed in severe clinical conditions. We have to consider good results strongly related with meticulous long term antimicrobial therapy.

Conclusions

Arterial aneurysms may present after Salmonellosis having a high risk of morbidity and mortality, mainly in patients with a concurrent infection of the spine and paravertebral tissue. Combined antimicrobial therapy and one-stage surgical treatment can be associated with good outcome.

Riassunto

OBIETTIVO: Riportare il caso di un aneurisma micotico dell'aorta addominale, secondario ad infezione da Salmonella ed associato a spondilodiscite, trattato in fase di rottura.

CASO CLINICO: Un uomo di 69 anni, iperteso, viene osservato in seguito alla presenza di una spondilodiscite ed operato in urgenza per la rottura di un aneurisma aortico secondario ad infezione da Salmonella (type H). L'intervento chirurgico consiste in una resezione del tessuto para-aortico infetto ed ad un innesto protesico aorto-aortico in sede sottorenale, utilizzando un graft in Dacron impregnato con Gentamicina. Il decorso postoperatorio è privo di complicanze di rilievo ed il paziente viene dimesso a 20 giorni dall'intervento, con prescrizione di terapia antimicrobica per le successive 8 settimane. I controlli clinico-strumentali nel follow-up (CT, scintigrafia con leucociti marcati, markers bioumorali) dimostrano una completa risoluzione del processo settico a distanza di 21 mesi dall'intervento.

CONCLUSIONI: Aneurismi aortici secondari a Salmonellosi sono rari, ma si associano ad alti tassi di morbilità e

mortalità. Il coinvolgimento vertebrale esprime la capacità dell'infezione da Salmonella ad estendersi rapidamente dalla parete aortica ai tessuti vicini, peggiorando in maniera significativa la prognosi. Il trattamento chirurgico tradizionale in un tempo, associato a terapia antimicrobica prolungata, può ottenere risultati soddisfacenti.

References

1. Chiesa R, Marone EM, Melissano G, Frigerio S, Brioschi C: *Open repair of pararenal aortic aneurysms*. Ann Ital Chir, 2004; 75:157-65.
2. Fernandez Guerrero ML, Aguado JM, Arribas A, Lumbreras C, de Gorgolas M: *The spectrum of cardiovascular infections due to Salmonella enterica: A review of clinical features and factors determining outcome*. Medicine, 2004; 83:123-38.
3. Finseth F, Abbott WM: *One-stage operative therapy for Salmonella mycotic abdominal aortic aneurysm*. Ann Surg, 1974; 179:8-11.
4. Forbes TL, Harding GE: *Endovascular repair of Salmonella-infected abdominal aortic aneurysms: A word of caution*. J Vasc Surg, 2006; 44:198-200.
5. Hsu RB, Lin FY: *Risk factors for bacteraemia and endovascular infection due to non-typhoid salmonella: A reappraisal*. QJM, 2005; 98:821-27.
6. Hsu RB, Lin FY: *Infected aneurysm of the thoracic aorta*. J Vasc Surg, 2008; 47:270-76.
7. Hsu RB, Chen RJ, Wang SS, Chu SH: *Infected aortic aneurysms: Clinical outcome and risk factor analysis*. J Vasc Surg, 2004; 40:30-35.
8. Kam MH, Toh LK, Tom SG, Wong D, Chia KH: *A case report of endovascular stenting in Salmonella mycotic aneurysm: A successful procedure in an immunocompromised patient*. Ann Acad Med Singapore, 2007; 36:1028-31.
9. Kan CD, Lee HL, Yang YJ: *Outcome after endovascular stent graft treatment for mycotic aortic aneurysm: A systematic review*. J Vasc Surg, 2007; 46(5):906-12.
10. Leach TJ, Sakamoto B, Ling AC, Donovan SM: *Salmonella spondylodiscitis associated with a mycotic abdominal aortic aneurysm and paravertebral abscess*. Emerg Radiol, 2009; 16:147-50.
11. Reichle FA, Tyson RR, Soloff LA, Lautjsh TJ, Rosemond JP: *Salmonellosis and aneurysm of the distal abdominal aorta: Case report with a review*. Ann Surg, 1970; 171:219-28.
12. Soravia-Dunand VA, Loo VG, Salit IE: *Aortitis due to Salmonella: Report of 10 cases and comprehensive review of the literature*. Clin Infect Dis, 1999; 29:862-68.
13. Veraldi GF, Dorrucchi V, Guglielmi A, de Manzoni G, Laterza E, Franceschetti ME, Leopardi F: *Salmonella C infection of aortic abdominal aneurysm*. Ann Ital Chir, 1998; 69:215-20.
14. Woon CY, Sebastian MG, Tay KH, Tan SG: *Extra-anatomic revascularization and aortic exclusion for mycotic aneurysms of the infrarenal aorta and iliac arteries in Asian population*. Am J Surg, 2008; 195:66-72.