



CASE REPORT / ПРИКАЗ БОЛЕСНИКА

Vertebral erosion due to chronic rupture of aneurismatic abdominal aorta

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SUMMARY

Introduction Extremely rarely, the evolution of abdominal aortic aneurysm (AAA) includes the phase when extravasations of the blood from a ruptured aneurysm is contained by the surrounding tissue, referred to as chronic (contained) rupture of the AAA.

Our aim was to call attention to this life-threatening condition, which is always challenging for diagnosis.

Case outline A 58-year-old man reported to the Emergency Center for significant abdominal pain. Ultrasound examination showed an infrarenal aneurysm of the abdominal aorta. A computed tomography scan of the thorax, abdomen, and pelvis with iodine contrast in arterial phase was performed. A free gas collection was observed between the liver and the anterior abdominal wall that is traced to a ruptured inflamed diverticulum on the transversal colon. Immediately distal to the branching sites of the renal arteries, the abdominal aorta extended forward and aneurismatically expanded. Posterior left, along the psoas muscle, a rupture of the aortic wall was seen, with an organized hematoma that accompanied the muscle. Between the hematoma and the aortic aneurysm, erosions of the anterior and lateral part of the vertebral bodies L2 and L3 were discovered. The patient underwent endovascular AAA repair (EVAR) and recovered well.

Conclusion Multidetector computed tomography angiography is a reliable, non-invasive, and necessary examination for localization and evaluation of the size of the AAA form, its chronic rupture, and complications such as vertebral body erosion.

Keywords: abdominal aorta aneurysm; chronic rupture; vertebral body erosion

INTRODUCTION

Abdominal aortic aneurysm (AAA) is a dilatation of its wall up to a diameter greater than 30 mm. AAA rupture is a significant cause of death for people over 55 years of age [1]. In cases where after a rupture and under certain circumstances hematoma formation occurs with localized and partly organized bleeding, a chronic AAA rupture is created which occurs in only 4% of all AAA cases [2]. One of the few complications can be the usurpation of vertebral bodies as a result of long-term compression on them [3].

CASE REPORT

A 58-year-old man reported to the Emergency Center for significant abdominal pain. There wasn't any history of diabetes, hypertension and chronic lung disease. He has been smoking and had myocardial infarction 15 years ago and had duodenal ulcer surgery 10 years ago. Physical examination revealed that the patient was sub-febrile and normotensive, and palpatory examination of the abdomen

revealed pulsations in supra and umbilical region. Laboratory findings were within normal limits. Ultrasound examination showed an infrarenal aneurysm of the abdominal aorta. In the native abdominal image in the supine position, we noticed a smaller free gas collection – pneumoperitoneum. A computed tomography (CT) scan of the thorax, abdomen, and pelvis with iodine contrast in the arterial phase was performed. We found right pleural effusion diameter of 25 mm, with no active pathological changes in the lungs. There was no significant finding in the mediastinum. A free gas collection was observed between the liver and the anterior abdominal wall, traced to a ruptured inflamed diverticulum on the transversal colon. Perihepatic and perisplenic free fluid and signs of mesenteritis were found. A ventral hernia of the anterior abdominal wall with bowel and adipose tissue within the hernia sac was noted. Immediately distal to the branching sites of the renal arteries, the abdominal aorta extended forward and aneurismatically expanded the largest diameter of about 15 cm, calcified wall with a marginal thrombus mass of about 16 cm in length (Figure 1). Posterior left, along the psoas muscle, a rupture of the aortic wall was

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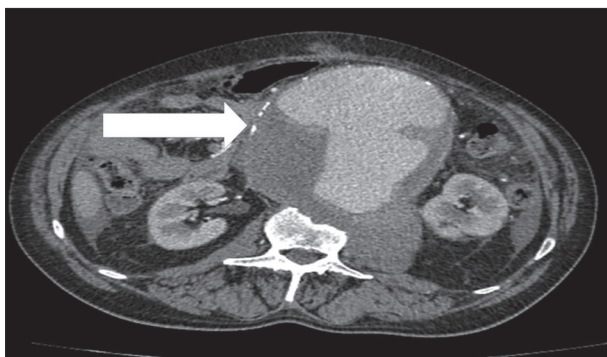


Figure 1. Computed tomography aortography showing the abdominal aorta extending forward and aneurismatically expanding with calcified walls and a marginal thrombus mass (white arrow)

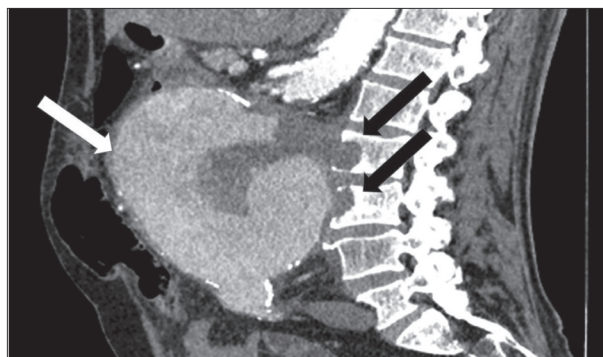


Figure 2. Sagittal computed tomography reconstruction showing the aortic aneurysm (white arrow) and discovered erosions of the anterior and lateral parts of the vertebral bodies L2 and L3 (black arrows)

seen, with an organized hematoma that accompanied the muscle about 12 cm in length. Between the hematoma and the aortic aneurysm, erosions of anterior and lateral parts of the vertebral bodies L2 and L3 were discovered (Figure 2). Right common iliac artery was aneurismatically dilated up to 35 mm in diameter, while the left one was of normal lumen width, with both having calcified walls.

The patient underwent endovascular AAA repair (EVAR), and he recovered well.

Before the EVAR procedure, the ruptured diverticulum needed to be resolved. After drainage of the peritoneum, surgeons performed colonic resection with primary anastomosis without colostomy placement. For the next 10 days, the patient was on antibiotic therapy. Postprocedural complications did not occur.

DISCUSSION

Chronic AAA rupture is a rare complication that occurs in 4–7% of cases [2, 4]. On CT examination, it appears as a sign of a “wrapped” aorta. It is presented as the discontinuity of the calcified aortic wall, a clearly limited mass of soft tissue density vaguely restricted from other adjacent structures (spine, psoas muscle) [5, 6]. There are no signs of contrast extravasation within the mass described, which clearly differentiates it from true AAA rupture [7, 8, 9]. The diagnosis of chronic AAA rupture is very important and necessary in order to be aware of possible complications, such as the erosion of vertebral bodies, as well as to find out their causes. The complications of vertebral bodies’ erosion could be paraplegia, inflammation, as well as death [10, 11].

Destruction of vertebral bodies occur as a complication in only 7% of AAA cases [3]. The cause of erosion of vertebral bodies can be a wide range of diseases of different

etiology: metastases, vertebral tumors, vertebral fractures, osteoporosis, and spondylitis [12, 13, 14]. They can occur separately from AAA in inflammatory diseases such as Behcet’s disease and syphilis. Compressive uses can occur in retroperitoneal tumors and retroperitoneal abscesses, and this is where CT diagnosis is crucial in differentiating from the compressive effect of chronic AAA rupture [6].

In the case of our patient, we noticed the sign of a “wrapped” aorta as the discontinuity of the calcified wall, then the mass of soft tissue density (formed by the old hematoma) extending from the AAA, vaguely delimited by the left psoas muscle and in contact with the spinal column and usurpations of the L2 and L3 vertebrae. We consulted an orthopedist and decided not to do anything with vertebral bodies and to let them repair spontaneously. Our patients underwent EVAR, the gold standard for repairing aneurismatic dilatation of the aorta [14, 15, 16]. The patient recovered well. Ten days after the procedure, he was discharged from the hospital, and has regularly been reporting for check-ups, without any sign of complication.

Based on the literature and as presented in our case, we can conclude that multidetector computed tomography angiography is a reliable non-invasive and necessary examination for localization and evaluation of the size of the AAA form, as well as for differential diagnosis of its complications.

Conflict of interest: None declared. The report follows the ethical guidelines of the most recent Declaration of Helsinki (Edinburgh, 2000) and has received approval from the local ethics committee.

Informed consent statement: Consent was obtained from the patient for publication of this report and any accompanying images.

REFERENCES

1. Tabayashi A, Kamada T, Abiko A, Tanaka R, Kin H. Chronic contained rupture of abdominal aortic aneurism complicated with aortic occlusion: a case report. *Surg Case Rep*. 2019; 5(1):99.
2. Rosenthal D, Clark MD, Stanton PE, Lamis PA. "Chronic-contained" ruptured abdominal aortic aneurysm: is it real? *J Cardiovasc Surg (Torino)*. 1986; 27(6):723–4.
3. Silvia IF, Dorota S, Marián Š, Daniel F, Lucia M, Roman M. Chronic dissecting aneurysm of ascending aorta with a large intramural thrombus and isolated aortic defects. *Cesk Patol*. 2019; 55(2):115–9.
4. Walker ST, Pipinos II, Johanning JM, Vargo CJ. Contained Rupture of an Abdominal Aortic Aneurysm With Extensive Vertebral Body and Retroperitoneal Space Destruction. *J Comput Assist Tomogr*. 2017; 41(5):839–42.
5. Krissian K, Carreira JM, Esclarin J, Maynar M. Semi-automatic segmentation and detection of aorta dissection wall in MDCT angiography. *Med Image Anal*. 2014; 18(1):83–102.
6. Paśławski M, Złomaniec J, Gwizdak J, Szafranek J. Ruptured abdominal aortic aneurysm in computed tomography. *Ann Univ Mariae Curie Skłodowska Med*. 2004; 59(2):308–12.
7. Hansen NJ. Computed Tomographic Angiography of the Abdominal Aorta. *Radiol Clin North Am*. 2016; 54(1):35–54.
8. Lombardi AF, Cardoso F, Fernandes A. Extensive Erosion of Vertebral Bodies Due to a Chronic Contained Ruptured Abdominal Aortic Aneurysm. *J Radiol Case Rep*. 2016; 10(1):27–34.
9. Nguyen TT, Le NT, Doan QH. Chronic contained abdominal aortic aneurysm rupture causing vertebral erosion. *Asian Cardiovasc Thorac Ann*. 2019; 27(1):33–5.
10. Rajab T, Beyene M, Yazdchi F, Menard M. Aortic Aneurysm Eroding into the Spine. *Aorta (Stamford)*. 2018; 6(2):68–9.
11. Kaneyuki D, Mogi K, Sakurai M, Nomura A, Sakata T, Takahara Y. An Eight-Year Natural History of Chronic Contained Rupture With Vertebral Erosion. *Ann Thorac Surg*. 2018; 105(5):e227.
12. Greif DN, Ghasem A, Butler A, Rivera S, Al Maaieh M, Conway SA. Multidisciplinary Management of Spinal Metastasis and Vertebral Instability: A Systematic Review. *World Neurosurg*. 2019; 128:e944–e955.
13. Posacioglu H, Islamoglu F, Apaydin AZ, Ozturk N, Oguz E. Rupture of a nonaneurysmal abdominal aorta due to spondylitis. *Texas Hear Inst J*. 2009; 36(1):65–8.
14. Baptista CA, DiDio LJ, Teofilovski-Parapid G. Variation in length and termination of the ramus circumflexus of the human left coronary artery. *Anat Anz*. 1990; 171(4):247–53.
15. Kichloo A, Khan MZ, Zain EA, Vipparla NS, Wani F. Post-Endovascular Abdominal Aortic Aneurysm Repair Abdominal Pain: A Learning Experience. *J Investig Med High Impact Case Rep*. 2019; 7:232470961986557.
16. Maeda K, Ohki T, Kanaoka Y, Baba T, Kaneko K, Shukuzawa K. Comparison between Open and Endovascular Repair for the Treatment of Juxtarenal Abdominal Aortic Aneurysms: A Single-Center Experience with Midterm Results. *Ann Vasc Surg*. 2017; 41:96–104.

Ерозије на вертебралним пршљенским телима услед хроничне руптуре анеуризме абдоминалне артерије

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САЖЕТАК

Увод Изразито ретко се код анеуризме абдоминалне аорте може видети фаза када се екстравазација крви из руптуриране анеуризме задржава у околном ткиву, што се назива хроничном (ограниченом) руптуром анеуризме абдоминалне аорте.

Циљ рада је био да се скрене пажња на ово животно угрожавајуће стање, које није увек лако открити.

Приказ болесника У Ургентни центар се јавио 58 година стар мушкарац због значајног бола у стомаку. Ултразвучно је верификована анеуризма инфрареналног дела абдоминалне аорте. Урађена је компјутеризована томографија са јодним контрастом. Откривена је колекција гаса између јетре и предњег трбушног зида која је праћена до руптурираног инфламраног дивертикулула трансверзалног дела колоне.

Непосредно испод исходишта реналних артерија уочило се анеуризматско проширење аорте које се пружало унапред. Позади лево, дуж *m. ilipsoasa*, уочена је руптура зида аорте са организованим хематомом који се пружа унутар мишића. Између хематома и анеуризматског проширења се виде ерозије предњег и спољашњег дела пршљенских тела L2 и L3. Урађена је ендоваскуларна репарација анеуризме абдоминалне аорте и болесник се добро опоравио.

Закључак Компјутеризована томографска аортографија, иначе неинвазивна метода, показала се као поуздана и неопходна у случају откривања хроничне руптуре анеуризме абдоминалне аорте са компликацијом у виду ерозија кичменних пршљенова.

Кључне речи: анеуризма абдоминалне аорте, хронична руптура, ерозије пршљенских тела