

The importance of abdominal aortic aneurysm screening: about a case report



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RESUMO

Introduction: Abdominal aortic aneurysm is more common in men aged ≥ 65 years and with smoking habits. The main complication is rupture, which has a high mortality rate.

Case report: This clinical case reports a 75-year-old man, ex-smoker, with benign prostatic hypertrophy, who was observed on a scheduled consultation with relapse of low urinary complaints. A suprapubic vesicoprostatic ultrasound scan was requested, which showed an incidental abdominal aortic aneurysm with about 16cm long and 11cm antero-posterior caliber. The patient was conducted to the emergency department, was hospitalized, and later underwent surgical correction of this aneurysm.

Comment: This case reflects the importance of the early identification of this acquired malformation in men aged ≥ 65 years through the implementation of an ultrasound screening program, not yet implemented in Portugal, but already recommended by several guidelines. Low urinary symptoms may be a presentation of this aneurysm.

Keywords: Aortic aneurysm, Abdominal; Mass screening; Lower urinary tract symptoms.

INTRODUCTION

The abdominal aortic aneurysm (AAA) corresponds to a dilation ≥ 3.0 cm in the anteroposterior or transverse planes of the abdominal aorta, mainly affecting men aged ≥ 65 years, especially those who had ever smoked. Its growth is silent, and, in most cases, it only manifests itself when it suffers rupture, a complication with a high mortality rate ($> 80\%$). Its diagnosis is often incidental, usually during a radiological investigation related to other pathologies. Treatment consists of surgical correction that, when done electively, effectively prevents rupture and death.¹ Thus, when this aneurysm is detected before rupture, presenting dimensions that justify elective precocious surgical correction (≥ 5.5 cm), mortality is significantly reduced, making the benefit of early detection through screening to be considered. Based on epidemiological studies carried out in developed

countries, it is estimated that the prevalence of AAA is 4-9% in men and 1% in women.² Age significantly impacts the incidence of AAA. In fact, its incidence rises sharply in individuals over 65 years of age.³ In Portugal, there are only two studies on the prevalence of AAA. The first, provided by the screening program “Aorta não avisa”, developed by the Portuguese Society of Angiology and Vascular Surgery, estimated a prevalence of 2.2% for men over 60 years of age and 3.94% for men over the age of 65 years.^{4,5} The main risk factors for the development of this aneurysm are male gender, age ≥ 65 years, smoking at least 100 cigarettes throughout life, family history in 1st degree of AAA, the existence of other arterial aneurysms, arterial hypertension, and dyslipidemia.²

Based on this information, several international guidelines recommend screening AAA in men aged ≥ 65 years, especially those who have smoked at least 100 cigarettes in their lifetime.^{1,6}

The purpose of this report is to present a case of AAA of generous dimensions, in a risky and apparently asymptomatic individual, diagnosed incidentally, as well as to reflect on the importance of implementing a

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screening program of AAA in men aged ≥ 65 years in Portugal, in terms of health benefits, which would consist of performing an abdominal ultrasound only once in a lifetime since this screening method is cost-effective, sensitive, specific, safe, acceptable, accessible to all target population and allows early therapeutic intervention.^{1,6-8}

CASE REPORT

Seventy-five-year-old man, autonomous in daily life activities and living with his wife. As a medical history, we highlight the fact that he is a former smoker (80 pack-year) and has hypertension, dyslipidemia, type two diabetes mellitus, chronic obstructive pulmonary disease, and benign prostatic hypertrophy (BPH). The patient was medicated with losartan + hydrochlorothiazide 100/25mg daily, lercanidipine 10mg daily, bisoprolol 5mg daily, simvastatin 20mg daily, indacaterol + glycopyrronium 85/43 micrograms daily, and dutasteride + tamsulosin 0.5/0.4mg daily, with good control of the above-mentioned pathologies. Regarding the surgical history, the patient underwent transurethral resection of the prostate (TURP) in 2018, with complete resolution of the low urinary symptoms related to BPH. There were no known cases of AAA in other family members.

In September 2019, the patient was observed on a scheduled appointment with his family doctor, with a recurrence of low urinary complaints (nocturia and polaquiuria) for three months, with no other symptoms reported. In this consultation, an objective abdominal examination and urine test strip were performed, which showed no changes. Also, no signs of volume overload were identified, like oedema, hypertension, or pulmonary auscultation abnormalities. The urine culture and sediment were both normal. Suprapubic vesicoprostatic ultrasound was performed by a radiologist about three weeks later. During this examination, a moderately enlarged prostate (about 34cc) was observed, and it was incidentally detected, superior to the bladder, a massive AAA about 16cm long, 11cm anteroposterior caliber, and 6cm lumen patent, and in close contact with it. In view of these findings, the patient received from the radiologist the indication of the imperative need to go to the emergency department (ED). On the same day, the patient presented to the ED, where



Figure 1. Abdominal aortic aneurysm represented in angiography by computed tomography.

he underwent angiography by computed tomography (angio-CT) and tridimensional angio-CT (Figures 1 and 2). The patient was hospitalized and, after two days, the AAA was surgically corrected without complications. He was discharged at the end of the sixth postoperative day, with complete resolution of the urinary symptoms.

COMMENT

The present case illustrates the incidental detection of an AAA whose dimensions justified elective surgical correction (≥ 5.5 cm).^{1,6} Bearing in mind that the patient's low urinary symptoms resolved after surgery, a AAA contribution to them cannot be excluded, through bladder compression by the aneurysm. Although AAA is rarely symptomatic before its rupture, when it is, low urinary symptoms are a frequent clinical manifestation, albeit very non-specific. According to *Lazarus et al*,⁹ 71% of patients with AAA may have imaging evidence of ureteral obstruction caused by the aneurysm and, thus, high urinary symptoms. However, as



Figure 2. Abdominal aortic aneurysm represented in tridimensional angiography by computed tomography.

mentioned, the patient in the present case had complaints of low urinary symptoms, which are less frequent in the context of AAA than high urinary symptoms. Regarding the present case, we are not able to establish a secure relationship between these symptoms and the AAA, at least exclusively since the patient had an enlarged prostate which can also contribute to them. However, the close contact between the AAA and the superior bladder makes a compression effect possible aggravating the symptoms caused by an enlarged prostate. Despite these considerations, the presence of low urinary symptoms in patients with BPH with optimized therapy and/or with no apparent cause should raise the suspicion of AAA, especially in men aged ≥ 65 years. The previous ultrasound did not confirm the existence of AA. The ultrasound performed before the TURP did not show the existence of an AAA. This could be explained since ultrasound is an operator-dependent examination as is the technique used. Probably,

the progressive growth in the extension of the AAA explains why the first ultrasound failed to detect it, at that time. The guideline of the European Society of Vascular Surgery¹ refers that the incidental diagnosis of AAA is frequent through imaging tests requested for the etiological study of symptoms such as chest pain, low back pain, abdominal pain, and low urinary symptoms, as was the case here. This case was taken to the Emergency Department because of the high risk of rupture and death, taking into account that AAA with $> 7\text{cm}$ in diameter has a probability of rupture at one year of 33%.¹⁰ This case raises the question of the usefulness of an ultrasound populational screening program in Portugal for men aged ≥ 65 years, a population in which the present case is included and in which this aneurysm is more common. In addition, the high smoking burden significantly increases the risk of developing AAA, which inserts the case described in the group of individuals at higher risk for AAA and who would benefit most from screening. Based on several large-scale randomized clinical trials¹¹⁻¹³ and meta-analyzes,¹⁴⁻¹⁶ there is strong evidence that this screening program in this population (men aged ≥ 65 years) would be cost-effective and significantly decreased the AAA-related mortality in other countries. This screening program is already implemented in the United Kingdom¹⁷ and in Sweden,¹⁸ where it has remained cost-effective and show to be effective in terms of secondary prevention. Besides that, the European Society of Vascular Surgery and the Canadian Task Force on Preventive Health Care *guidelines*^{1,6} recommend single screening for AAA by abdominal ultrasound in men aged ≥ 65 years. Bearing in mind that the prevalence of AAA in Portugal is similar to that estimated in the aforementioned studies (2.2-3.9%),^{4,5} it is plausible that the implementation of a screening program in this country will be clinically relevant, preventing AAA from growing to dimensions with a high probability of rupture and consequent risk of death, aiming the early detection of asymptomatic AAA and reduction of complications such as rupture and death.

In conclusion, given the higher incidence of AAA in men ≥ 65 years of age, ultrasound screening performed once in a lifetime in this population, which is safe and cost-effective, may contribute to lowering the mortality and morbidity related to this pathology.



REFERENCES

1. Wanhainen A, Verzini F, Van Herzelee I, Allaire E, Bown M, Cohnert T, et al. Corrigendum to 'European Society for Vascular Surgery (ESVS) 2019 clinical practice guidelines on the management of abdominal aortoiliac artery aneurysms' [European Journal of Vascular & Endovascular Surgery 57/1 (2019) 8-93]. *Eur J Vasc Endovasc Surg.* 2020;59(3):494.
2. Kent KC, Zwolak RM, Egorova NN, Riles TS, Manganaro A, Moskowitz AJ, et al. Analysis of risk factors for abdominal aortic aneurysm in a cohort of more than 3 million individuals. *J Vasc Surg.* 2010;52(3):539-48.
3. Howard DP, Banerjee A, Fairhead JF, Handa A, Silver LE, Rothwell PM, et al. Population based study of incidence of acute abdominal aortic aneurysms with projected impact of screening strategy. *J Am Heart Assoc.* 2015;4(8):e001926.
4. Fernandes e Fernandes J, coord. Rede de referência hospitalar: angiologia e cirurgia vascular [Internet]. Lisboa: Serviço Nacional de Saúde; 2017. Available from: <https://www.sns.gov.pt/wp-content/uploads/2017/05/RRH-Angiologia-e-Cirurgia-Vascular-Para-CP.pdf>
5. Castro-Ferreira R, Mendes P, Couto P, Barreira R, Peixoto F, Aguiar M, et al. Rastreo populacional de aneurisma da aorta abdominal em Portugal: o imperativo da sua realização [Population screening for abdominal aortic aneurysm in Portugal: the imperative of its realization]. *Angiol Cir Vasc.* 2016;12(4):267-70. Portuguese
6. Canadian Task Force on Preventive Health Care. Recommendations on screening for abdominal aortic aneurysm in primary care. *CMAJ.* 2017; 189(36):E1137-45.
7. LeFevre ML. Screening for abdominal aortic aneurysm: US Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2014;161(4):281-90.
8. Hirsch AT, Haskal ZJ, Hertzner NR, Bakal CW, Creager MA, Halperin JL, et al. ACC/AHA 2005 practice guidelines for the management of patients with peripheral arterial disease (lower extremity, renal, mesenteric, and abdominal aortic): a collaborative report from the American Association for Vascular Surgery/Society for Vascular Surgery, Society for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology, Society of Interventional Radiology, and the ACC/AHA Task Force on Practice Guidelines (Writing Committee to Develop Guidelines for the Management of Patients With Peripheral Arterial Disease): endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation; National Heart, Lung, and Blood Institute; Society for Vascular Nursing; TransAtlantic Inter-Society Consensus; and Vascular Disease Foundation. *Circulation.* 2006;113(11): e463-654.
9. Lazarus JA, Marks MS. Aneurysm of the abdominal aorta associated with urinary symptoms. *J Urol.* 1944;52(2):115-25.
10. Kent KC. Clinical practice: abdominal aortic aneurysms. *N Engl J Med.* 2014;371(22):2101-8.
11. Thompson SG, Ashton HA, Gao L, Buxton MJ, Scott RA. Final follow-up of the Multicentre Aneurysm Screening Study (MASS) randomized trial of abdominal aortic aneurysm screening. *Br J Surg.* 2012;99(12):1649-56.
12. Lindholt JS, Sørensen J, Sjøgaard R, Henneberg EW. Long term benefit and cost effectiveness analysis of screening for abdominal aortic aneurysms from a randomized controlled trial. *Br J Surg.* 2010;97(6):826-34.
13. McCaul KA, Lawrence-Brown M, Dickinson JA, Norman PE. Long-term outcomes of the Western Australian trial of screening for abdominal aortic aneurysms: secondary analysis of a randomized clinical trial. *JAMA Intern Med.* 2016;176(12):1761-7.
14. Cosford PA, Leng GC. Screening for abdominal aortic aneurysm. *Cochrane Database Syst Rev.* 2007;(2):CD002945.
15. Lindholt JS, Norman P. Screening for abdominal aortic aneurysm reduces overall mortality in men: a meta-analysis of the mid-and long-term effects of screening for abdominal aortic aneurysms. *Eur J Vasc Endovasc Surg.* 2008;36(2):167-71.
16. Takagi H, Goto SN, Matsui M, Manabe H, Umemoto T. A further meta-analysis of population-based screening for abdominal aortic aneurysm. *J Vasc Surg.* 2010;52(4):1103-8.
17. Benson RA, Poole R, Murray S, Moxey P, Loftus IM. Screening results from a large United Kingdom abdominal aortic aneurysm screening center in the context of optimizing United Kingdom National Abdominal Aortic Aneurysm Screening Programme protocols. *J Vasc Surg.* 2016;63(2):301-4.
18. Wanhainen A, Hultgren R, Linné A, Holst J, Gottsäter A, Langenskiöld M, et al. Outcome of the Swedish nationwide abdominal aortic aneurysm screening program. *Circulation.* 2016;134(16):1141-8.

AUTHORS' CONTRIBUTION

Conceptualization, JT, NTP, and HS (all authors were responsible for defining the purposes of this case report); methodology, JT, NTP, and HS (all authors were responsible for planning the different stages in the elaboration of the scientific article); investigation, JT, and NTP (responsible for the scientific investigation that produced the references cited in the article, in order to support the discussion of this case report); data curation, HS (doctor who approached the patient at the first consultation and requested the first diagnostic tests, including the vesicoprostatic ultrasound; he also obtained the patient's free and informed written consent); writing, original draft, JT; writing, review and editing, JT; visualization, JT, and NTP (responsible for formatting the article); supervision, JT (wrote the first version of the manuscript and was responsible for reviewing the last one; he also submitted the article to the journal's online platform).

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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ABSTRACT

A IMPORTÂNCIA DO RASTREIO DO ANEURISMA DA AORTA ABDOMINAL: A PROPÓSITO DE UM CASO CLÍNICO

Introdução: O aneurisma da aorta abdominal é mais comum em homens com idade ≥ 65 anos e com hábitos tabágicos. A principal complicação é a rutura, que apresenta uma elevada taxa de mortalidade.

Descrição do caso: Este caso clínico incide sobre um homem de 75 anos, ex-fumador, com hipertrofia benigna prostática, que recorreu a consulta programada com recorrência de queixas urinárias baixas. A ecografia vesicoprostática por via suprapúbica solicitada objetivou um aneurisma da aorta abdominal com cerca de 16cm de extensão e 11cm de calibre antero-posterior. O doente foi encaminhado ao serviço de urgência, tendo ficado internado e posteriormente foi submetido a correção cirúrgica deste aneurisma.

Comentário: Este caso reflete a importância da identificação precoce desta patologia em homens com idade ≥ 65 anos através da implementação de um programa de rastreio ecográfico, ainda não implementado em Portugal, mas já recomendado por várias guidelines. Sintomas urinários baixos poderão ser uma apresentação deste aneurisma.

Palavras-chave: Aneurisma da aorta, Abdominal; Rastreio populacional; Sintomas do trato urinário inferior.
