A Case of a Paracardial Osteophyte Causing Atrial Compression

Stergios Tzikas, Konstantinos Triantafyllou, Christodoulos Papadopoulos, and Vassilios Vassilikos

3rd Department of Cardiology, Ippokrateio Hospital, Aristotle University of Thessaloniki, Thessaloniki, Greece

Correspondence should be addressed to Stergios Tzikas; tzikas@gmail.com

Received 8 September 2016; Accepted 13 December 2016

Copyright © 2016 Stergios Tzikas et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Osteophytes are pointed or beaked osseous outgrowths at the margins of articular surfaces that are often associated with degenerative changes of articular cartilage. They are the most common aspect of osteoarthritis and they infrequently cause symptoms by compression of the adjacent anatomic structures, such as nerves, vessels, bronchi, and esophagus. We present here a rare case of a patient with a left atrial deformation by a large osteophyte.

1. Introduction

Dyspnea is the key symptom of heart failure, which accounts for 1 in 9 deaths in the United States in the year 2013 [1]. However, various extracardiac conditions can also lead to dyspnea, complicating the differential diagnosis. The structural deformation of cardiac chambers and of the pulmonary veins is among rare cases of cardiac dyspnea [2].

The shape of the cardiac chambers may be shown deformed usually by cardiac masses, tumors, thrombi, and cysts. Osteophytes are pointed or beaked osseous outgrowths at the margins of articular surfaces that are often associated with degenerative changes of articular cartilage. They are the most common aspect of osteoarthritis and they infrequently cause symptoms by compression of the adjacent anatomic structures, such as nerves, vessels, bronchi, and esophagus. We present a rare case of a patient with dyspnea and left atrial deformation by a large osteophyte.

2. Case Presentation

A 79-year-old male presented to our outpatient clinic with dyspnea at mild exercise (New York Heart Association classification of II) and back pain for the previous 3 months. His medical history was significant for arterial hypertension, chronic atrial fibrillation, mild normochromic anemia of unknown cause, and osteoarthritis.

The clinical examination revealed dominant jugular veins and a systolic murmur. A transthoracic echocardiogram (Figure 1) was performed and revealed a normal systolic function of the left ventricle. The left atrium was severely dilated (52 × 58 mm, 40 mL/m²) and extrinsically deformed by a mass of unknown origin. Further echocardiographic findings included a heavily calcified mitral annulus with moderate mitral stenosis (mean pressure gradient: 6 mmHg, mitral valve area 1.7 cm²) and mild mitral regurgitation. In addition, the ascending aorta and the right atrium were mildly dilated, a mild tricuspid regurgitation appeared, and the right ventricular systolic pressure was estimated at 48 mmHg.

The aforementioned findings were confirmed by a subsequent transesophageal echocardiogram, as well as an apparent indentation in the posterior left atrial wall, while the pulmonary venous flow appeared unaffected.

Chest Computer Tomography (CT) was performed (Figure 2) in order to further investigate the origin of the left atrial compression. An osteophyte was arising at the level of the seventh and eighth thoracic (T7-T8) vertebrae, which was large enough to protrude into the posterior wall of the left atrium. These findings were confirmed using magnetic resonance imaging (Figure 3).

The diagnostic evaluation contributed to the final diagnosis of heart failure due to mitral valve degeneration. Pulmonary hypertension was attributed to the presence of
moderate mitral stenosis. The patient was prescribed diuretics, which led to gradual improvement of his clinical status.

3. Discussion

Osteophytes are osseous outgrowths located at the margins of articular surfaces. They are usually diagnosed incidentally during imaging examinations in elderly individuals, as they are mostly asymptomatic. However, several complications have been reported due to the presence of vertebral osteophytes. The most frequent complications are myelopathy and radiculopathy which occur because of mechanical compression of the vertebral canal [3, 4] and dysphagia, caused by mechanical compression of the esophagus [5–15]. Other rarer complications may result from external compression of the trachea [16, 17], the bronchi [18], the adjacent arteries [19–22], and nerves [23, 24]. Furthermore, chronic throat symptoms [25], back pain [26], Brown-Sequard syndrome [27], Horner syndrome [28], intracranial hypotension [29, 30], chronic obstructive pneumonia [31], traumatic thoracic aortic rupture [32], esophageal perforation [33], and acute urinary retention [34] have been described as osteophytic complications. As far as heart complications are concerned, a traumatic heart perforation [35] and two cases of left atrial deformity by large osteophytes [26, 36] have been so far reported.

In our case a large osteophyte compressed the left atrium. The transthoracic echocardiogram led to the suspicion of pulmonary veins compression. This hypothesis could be rejected by the means of transesophageal echocardiography. Transesophageal echocardiography is a useful tool for pulmonary vein investigation, although there are no validated criteria for the definition of pulmonary vein (PV) stenosis. It seems that an increased maximum PV Doppler flow velocity (>1.1 m/s) combined with color Doppler turbulence may be a reliable index [37, 38].

Vertebral osteophytes are common in the general population but very rarely protrude into the left atrium. This condition is rare, with fewer than 5 previously reported cases. Our case is similar to previously reported, except that we believe this is the first reported case with suspicion of pulmonary vein stenosis.

Competing Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

References

[1] Writing Group Members, D. Mozaffarian, E. J. Benjamin et al., “Executive summary: heart disease and stroke statistics—2016 update: a report from the American Heart Association,” Circulation, vol. 133, no. 4, pp. 447–454, 2016.
[2] P. Pazos-Lopez, C. García-Rodríguez, A. Guitián-González et al., “Pulmonary vein stenosis: etiology, diagnosis and management,” World Journal of Cardiology, vol. 8, no. 1, pp. 81–88, 2016.
[3] S. Abhaykumar, A. Tyagi, and G. M. Towns, “Thoracic vertebral osteophyte-causing myelopathy: early diagnosis and treatment,” Spine, vol. 27, no. 14, pp. E334–E336, 2002.
[4] S. S. Mishra, S. Das, S. K. Behera, and D. K. Parida, “Anterior cervical osteophytes with multilevel disc prolapse causing progressive dysphagia and quadriparesis,” Neurology India, vol. 60, no. 3, pp. 366–367, 2012.
[5] J. M. Flynn, “Anterior cervical osteophytes causing dysphagia,” Boletín de la Asociación Médica de Puerto Rico Journal, vol. 83, no. 2, pp. 47–53, 1991.
[6] I. Albayrak, S. Başçacı, A. Salli, S. Kucuksen, and H. Uğurlu, “A rare cause of dysphagia: compression of the esophagus by
an anterior cervical osteophyte due to ankylosing spondylitis,"* Korean Journal of Internal Medicine*, vol. 28, no. 5, pp. 614–618, 2013.

[7] Y.-R. Chen, K. Sung, and S. Tharin, "Symptomatic anterior cervical osteophyte causing dysphagia: case report, imaging, and review of the literature,"* Cureus*, vol. 8, no. 2, article e473, 2016.

[8] J. S. Hwang, C. K. Choong, and W. I. Joo, "Giant anterior cervical osteophyte leading to dysphagia,"* Korean Journal of Spine*, vol. 10, no. 3, pp. 200–202, 2013.

[9] S. Kilincalp, H. Akinci, O. Isak, Ş. Coban, and İ. Yüksel, "A rare case of dysphagia: compression of esophagus by a giant thoracic spine osteophyte,"* Endoscopy*, vol. 47, no. 1, article E1, 2015.

[10] S. H. Lee, S. O. Bae, and N.-J. Paik, "Aggravated dysphagia caused by cervical osteophyte in a patient with Parkinson disease,"* American Journal of Physical Medicine and Rehabilitation*, vol. 93, no. 12, article e9, 2014.

[11] H. W. Lin, A. M. Quesnel, A. S. Holman, W. T. Curry Jr., and M. B. Rho, "Hypertrophic anterior cervical osteophytes causing dysphagia and airway obstruction,"* Annals of Otology, Rhinology and Laryngology*, vol. 118, no. 10, pp. 703–707, 2009.

[12] S. S. Rana, D. K. Bhasin, C. Rao, R. Gupta, B. Nagi, and K. Singh, "Thoracic spine osteophyte causing dysphagia,"* Endoscopy*, vol. 44, supplement 2, pp. E19–E20, 2012.

[13] J. W. Seo, J. W. Park, J. C. Jang et al., "Anterior cervical osteophytes causing dysphagia and paradoxical vocal cord motion leading to dyspnea and dysphonia,"* Annals of Rehabilitation Medicine*, vol. 37, no. 5, pp. 717–720, 2013.

[14] Y. Tanaka, Y. Yoneda, Y. Kita, and M. Tabuchi, "Dysphagia due to giant cervical osteophytes,"* Brain and Nerve*, vol. 54, no. 10, pp. 908–911, 2002.

[15] Y. K. Varsak, M. A. Eryilmaz, and H. Arbağ, "Dysphagia and airway obstruction due to large cervical osteophyte in a patient with ankylosing spondylitis,"* The Journal of Craniofacial Surgery*, vol. 25, no. 4, pp. 1402–1403, 2014.

[16] S. Kapetanakis, I. Vasileiadis, N. Papanas, R. Goulimestone, and E. Maltezos, "Can a giant cervical osteophyte cause dysphagia and airway obstruction? A case report,"* Wiener Klinische Wochenschrift*, vol. 123, no. 9–10, pp. 291–293, 2011.

[17] F. Mairui, L. Stella, L. Sardo, and S. Bouamasssa, "Dysphagia and dyspnea due to an anterior cervical osteophyte,"* Archives of Orthopaedic and Trauma Surgery*, vol. 122, no. 4, pp. 245–247, 2002.

[18] R. Giger, P. Dulguerov, and M. Payer, "Anterior cervical osteophytes causing dysphagia and dyspnea: an uncommon entity revisited,"* Dysphagia*, vol. 21, no. 4, pp. 259–263, 2006.

[19] I. Mourard, S. Azakri, G. Boniface, A. Bonafé, and I. L. Maldonado, "Teaching NeuroImages: intermittent symptomatic occlusion of the vertebral artery caused by a cervical osteophyte,"* Neurology*, vol. 80, no. 5, article e54, 2013.

[20] O. Ozkul-Wermester, R. Lefaucheur, and B. Bourre, "Cervical osteophyte causing cerebellar infarction,"* The Lancet*, vol. 383, no. 9930, p. 1748, 2014.

[21] A. Rosengart, T. R. Hedges III, P. A. Teal et al., "Intermittent downbeat nystagmus due to vertebral artery compression,"* Neurology*, vol. 43, no. 1, pp. 216–218, 1993.

[22] K. A. Walsh, D. Keane, and G. J. Fahy, "Close relationship of segmental spinal artery to posterior left atrium in patients with osteophyte formation enlarged left atrium and atrial fibrillation,"* Heart Rhythm*, vol. 12, no. 4, article 851, 2015.

[23] K. S. Orhan, S. Acar, M. Ulusan, A. Aydos Eli, and Y. Gülüdken, "Persistent cough associated with osteophyte formation and vagus nerve impingement following cervical spinal surgery: case report,"* Journal of Neurosurgery: Spine*, vol. 19, no. 2, pp. 167–169, 2013.

[24] V. Patrun, P.-Y. Roudaut, J. Lerat, M. Vivent, J.-P. Bessède, and K. Aubry, "Isolated hypoglossal palsy due to cervical osteophyte,"* European Annals of Otorhinolaryngology, Head and Neck Diseases*, vol. 129, no. 1, pp. e44–e46, 2012.

[25] A. Alaani, R. Hogg, and A. P. Johnson, "Chronic throat symptoms cured by osteophyte excision,"* Journal of the Royal Society of Medicine*, vol. 97, no. 4, pp. 181–182, 2004.

[26] M. Muretti, M. Manca, and M. Portoghese, "Uncommon back pain after cardiac surgery: left atrium deformed by huge osteophyte,"* Asian Cardiovascular and Thoracic Annals*, vol. 24, no. 7, pp. 735, 2016.

[27] D. Guan, G. Wang, M. Clare, and Z. Kuang, "Brown-Sequard syndrome produced by calcified herniated cervical disc and posterior vertebral osteophyte: case report,"* Journal of Orthopaedics*, vol. 12, supplement 2, pp. S260–S263, 2015.

[28] P. G. Bernad and V. P. Perlo, "Horner syndrome with causalgia,"* Neurology*, vol. 30, no. 5, pp. 534–535, 1980.

[29] D. Dash, A. Jalali, V. Harish, and I. Omeis, "Transpedicular surgical approach for the management of thoracic osteophyte-induced intracranial hypotension refractory to non-operative modalities: case report and review of literature,"* European Spine Journal*, vol. 25, supplement 1, pp. 209–215, 2016.

[30] L.-C. Hung and Y.-C. Hsu, "Spontaneous intracranial hypotension resulting from a thoracic osteophyte,"* Journal of Clinical Neuroscience*, vol. 22, no. 6, pp. 1054–1056, 2015.

[31] J. A. Leon, K. T. Calamia, and J. P. Leventhal, "Chronic obstructive pneumonia caused by a vertebral body osteophyte,"* Mayo Clinic Proceedings*, vol. 75, no. 2, pp. 185–188, 2000.

[32] P. O. Myers, A.-L. Hachulla-Lemaire, and N. Murith, "Traumatic thoracic aortic rupture: caught between a thoracic vertebral osteophyte and a hard place,"* The Journal of Thoracic and Cardiovascular Surgery*, vol. 150, no. 6, pp. 1661–1662, 2015.

[33] S. Rathinam, T. Makarawo, R. Norton, and F. J. Collins, "Thoracic osteophyte: rare cause of esophageal perforation,"* Diseases of the Esophagus*, vol. 23, no. 1, pp. E5–E8, 2010.

[34] H. Minami, O. Ueki, M. Hashimoto, H. Mukai, M. Tada, and K. Kawaguchi, "Acute urinary retention associated with fractured osteophyte,"* Urology*, vol. 63, no. 4, pp. 778–780, 2004.

[35] A. Sauvageau, C. Kremer, and S. Racette, "Traumatic heart perforation by a D5 osteophyte: a case report,"* Medicine, Science and the Law*, vol. 47, no. 4, pp. 350–352, 2007.

[36] G. X. Morales, C. S. Elayi, and V. Y. Reddy, "Extracardiac osteophytic deformation of the left atrium: an unusual anatomic finding during atrial fibrillation ablation,"* Heart Rhythm*, vol. 8, no. 8, pp. 1305, 2011.

[37] W.-C. Yu, T.-L. Hsu, C.-T. Tai et al., "Acquired pulmonary vein stenosis after radiofrequency catheter ablation of paroxysmal atrial fibrillation,"* Journal of Cardiovascular Electrophysiology*, vol. 12, no. 8, pp. 887–892, 2001.

[38] S. Stavrakis, G. Madden, D. Pokharel et al., "Transesophageal echocardiographic assessment of pulmonary veins and left atrium in patients undergoing atrial fibrillation ablation,"* Echocardiography*, vol. 28, no. 7, pp. 775–781, 2011.