



Benign Hyperostosis of the Rib

IMAGES IN CLINICAL RADIOLOGY

MICHIEL VAN ELSEN

FILIP M. VANHOENACKER

ANNEMIEK SNOECKX

*Author affiliations can be found in the back matter of this article

]ubiquity press

ABSTRACT

Teaching point: Benign hyperostosis of the rib is a benign entity consisting of a stress phenomenon that should not be confused with Paget, fibrous dysplasia, or osteoblastic metastasis.

CORRESPONDING AUTHOR:

Filip M. Vanhoenacker

Department of Radiology,
University Hospital of Antwerp,
Antwerp, Belgium; Department
of Radiology, AZ Sint-Maarten,
Mechelen, Belgium; Faculty of
Medicine and Health Sciences,
UGent/ University Antwerp,
Belgium

Filip.vanhoenacker@telenet.be

KEYWORDS:

Hyperostosis, diffuse idiopathic
skeletal hyperostosis, ribs,
benign

TO CITE THIS ARTICLE:

Van Elsen M, Vanhoenacker
FM, Snoeckx A. Benign
Hyperostosis of the Rib.
*Journal of the Belgian Society
of Radiology.* 2024; 108(1):
26, 1–4. DOI: <https://doi.org/10.5334/jbsr.3550>

CASE

A 77-year-old patient underwent a computed tomography (CT) scan of the chest for a 1-year follow-up of a lung nodule, which was unchanged. In addition, there was diffuse cortical thickening of the posterior aspect of the right fifth rib with a large osseous excrescence at the fifth costovertebral joint (Figure 1). The left side was normal.

The increased density of the involved rib was also clearly appreciated on the axial and coronal minimal intensity projection (MIP) images (Figure 2A and 2B).

Sagittal images showed diffuse idiopathic skeletal hyperostosis (DISH) with flowing osteophytes (Figure 3).

COMMENTS

Benign rib hyperostosis is a benign stress reaction that may be misinterpreted, especially in patients with an oncologic history. It is often seen in correlation with disorders causing excessive vertebral ossification, such as DISH, seronegative spondyloarthritis, and quadriplegia [1].

Hyperostosis typically manifests in the posteromedial aspect of the rib and is commonly observed in conjunction with an osseous excrescence spanning the respective costovertebral joint and associated ossification of the radiate ligament, which attaches the head of the rib to the vertebral body. It is believed that ankylosis of the

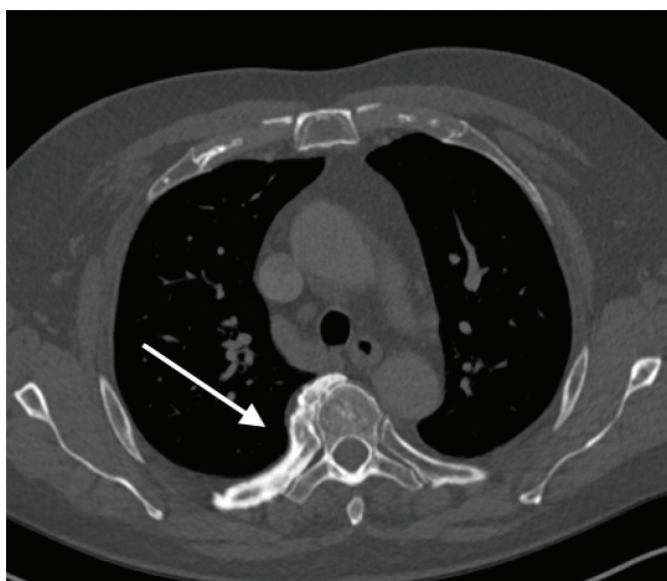


Figure 1 CT thorax axial images in bone window.

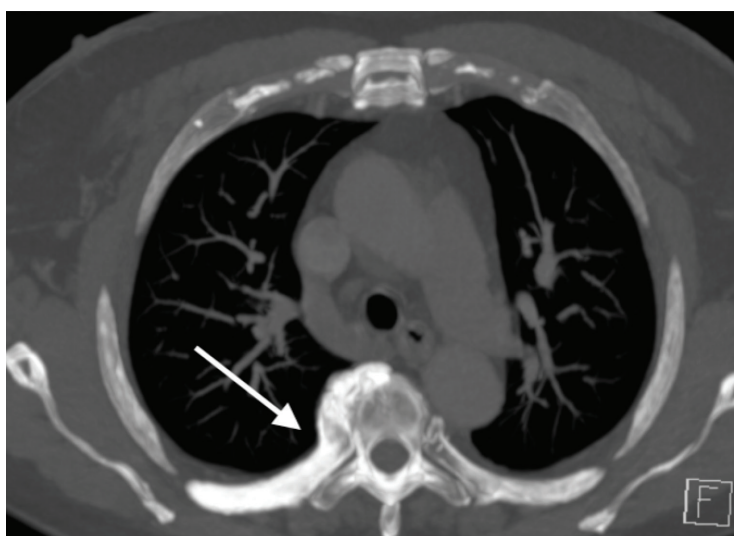


Figure 2A CT thorax axial MIP images.

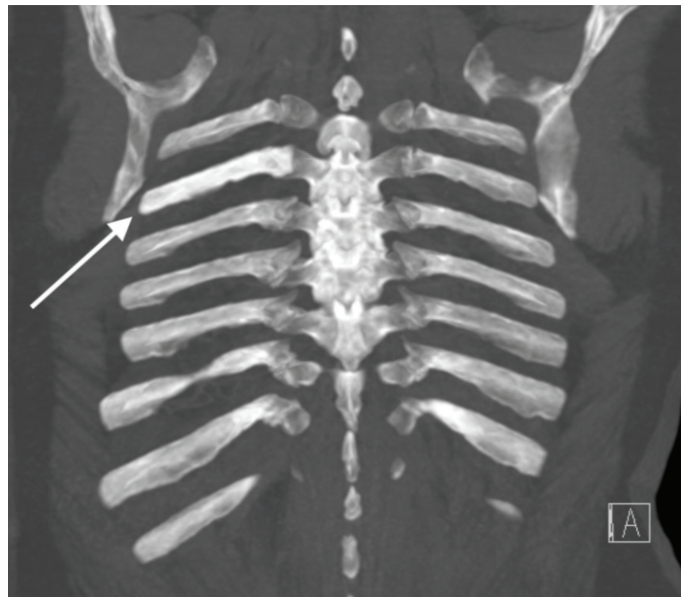


Figure 2B CT thorax coronal MIP images.

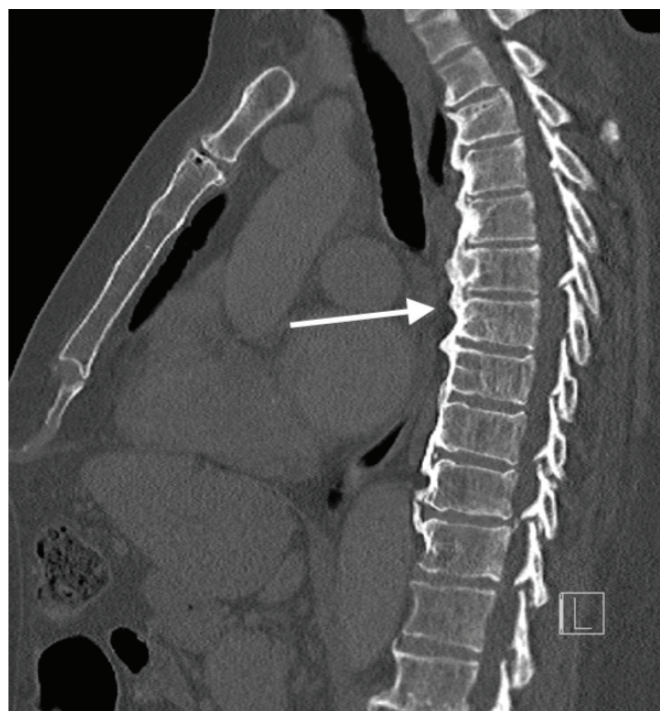


Figure 3 CT thorax sagittal images in bone window.

costovertebral joint causes increased loading forces on the rib due to loss of costovertebral joint mobility, resulting in bony remodeling, and reactive hyperostosis on conventional radiography (CR) and CT. Bone scintigraphy may show increased radiotracer uptake.


Due to aortic pulsations inhibiting ossification, there is a 9:1 predilection for right-to-left rib involvement of the thoracolumbar spine.

The differential diagnosis includes fibrous dysplasia, Paget's disease, melorheostosis, and renal osteodystrophy. Fibrous dysplasia may lead to fusiform enlargement of the ribs with loss of normal trabeculation and cortical thinning

as opposed to thickening. Paget's disease rarely involves the ribs (1%–4%), showing cortical thickening and bone enlargement, resembling reactive hyperostosis. However, the trabeculae are thickened, and imaging manifestations of Paget's disease are usually present elsewhere in the skeleton, although monostotic involvement may occur. Cortical thickening in melorheostosis is more extensive and has a typical candle drip appearance with typically associated medullary sclerosis and soft tissue calcifications. Renal osteodystrophy is characterized by generalized bone sclerosis with an associated rugger-jersey spine rather than being isolated.

COMPETING INTERESTS

The author has no competing interests to declare.

Annemiek Snoeckx  orcid.org/0000-0003-2101-2783
Department of Radiology, University Hospital of Antwerp,
Antwerp, Belgium

AUTHOR AFFILIATIONS

Michiel Van Elsen  orcid.org/0000-0002-0512-5027
Department of Radiology, University Hospital of Antwerp,
Antwerp, Belgium

Filip M. Vanhoenacker  orcid.org/0000-0002-7253-1201
Department of Radiology, University Hospital of Antwerp,
Antwerp, Belgium; Department of Radiology, AZ Sint-Maarten,
Mechelen, Belgium; Faculty of Medicine and Health Sciences,
UGent/ University Antwerp, Belgium

REFERENCE

1. **O'Bryant MW, Mahraj RP, Allen TW, Flemming DJ.** Rib hyperostosis: A benign entity with suspicious imaging features. *Radiol Case Rep.* 2022;17(9):2987–2990. Published 2022 Jun 17. DOI: <https://doi.org/10.1016/j.radcr.2022.05.058>.

TO CITE THIS ARTICLE:

Van Elsen M, Vanhoenacker FM, Snoeckx A. Benign Hyperostosis of the Rib. *Journal of the Belgian Society of Radiology.* 2024; 108(1): 26, 1–4. DOI: <https://doi.org/10.5334/jbsr.3550>

Submitted: 15 February 2024 **Accepted:** 4 March 2024 **Published:** 18 March 2024

COPYRIGHT:

© 2024 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <https://creativecommons.org/licenses/by/4.0/>.

Journal of the Belgian Society of Radiology is a peer-reviewed open access journal published by Ubiquity Press.