

# The doughnut sign

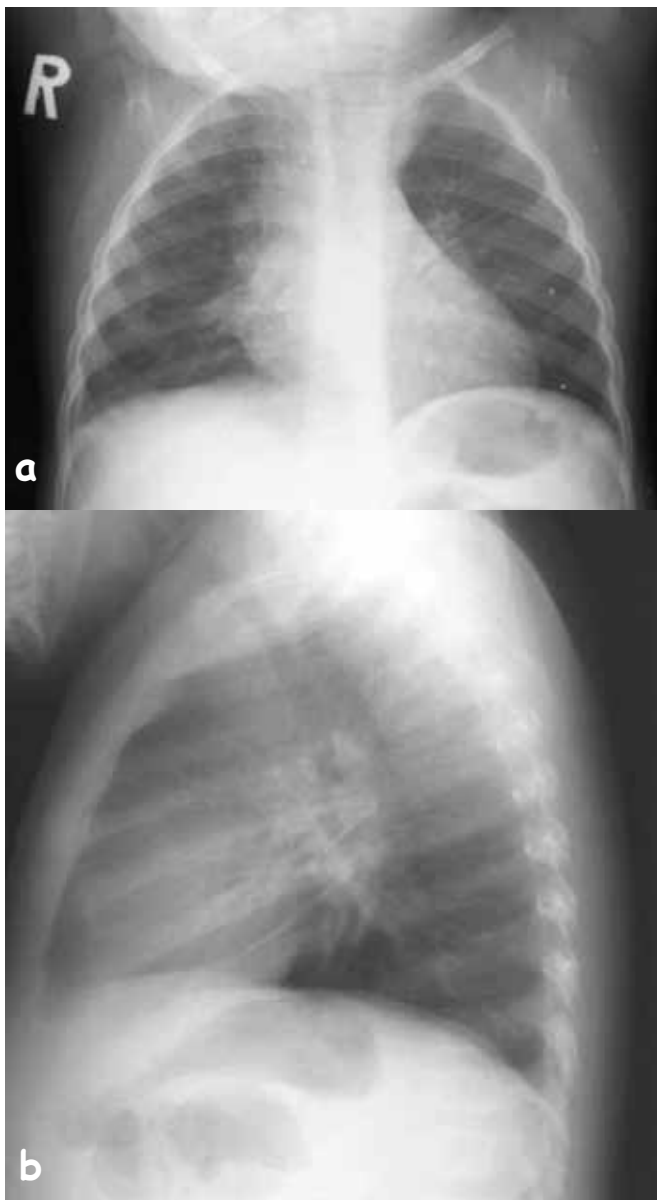
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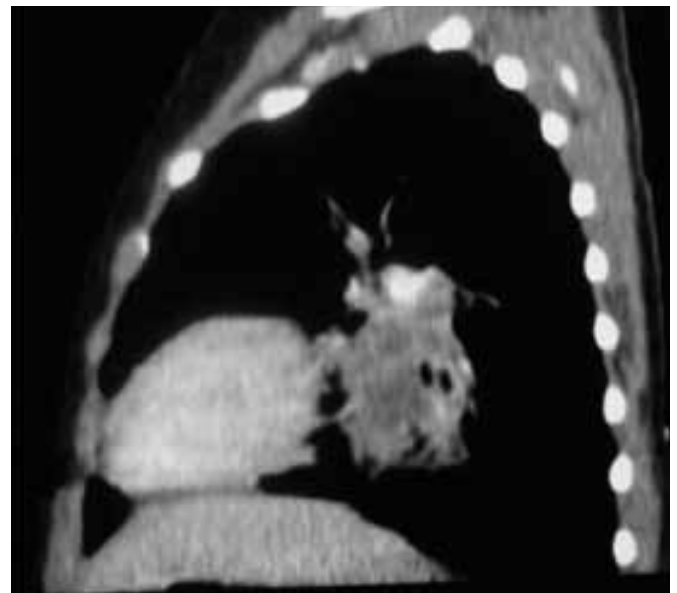
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**Fig. 1.** (a) Frontal chest radiograph demonstrating lobulated, dense masses filling the hilar points. Note the Ghon focus in the right mid-zone. (b) Lateral chest radiograph demonstrating the doughnut sign formed by the normal right and left main pulmonary arteries and the aortic arch anteriorly and superiorly, the hilar and subcarinal lymphadenopathy inferiorly, with the central radiolucent centre formed by the trachea and upper lobe bronchi.

Chest radiographs remain the imaging modality of choice for diagnosing diseases such as tuberculosis (TB) in children in developing countries. Despite chest radiographs not being sensitive or specific enough to detect lymphadenopathy in children with suspected pulmonary TB, there are specific radiographic findings that are unequivocal.<sup>1</sup> Lobulated, oval, dense masses filling the hilar points on the frontal chest radiograph (Fig. 1, a) and making a full ring on the lateral chest radiograph, the doughnut sign (Fig. 1, b), are characteristic of TB lymphadenopathy.<sup>1</sup>

The doughnut sign visualised on the lateral chest radiograph is formed by the normal right and left main pulmonary arteries and the posterior aspect of the aortic arch anteriorly and superiorly and hilar and subcarinal lymphadenopathy inferiorly, with the central radiolucent centre formed by the trachea and upper lobe bronchi<sup>1-3</sup> (Fig. 1, b and Fig. 2). The doughnut sign represents superimposed hilar and subcarinal lymphadenopathy<sup>1</sup> (Fig. 3, a and b).



**Fig. 2.** Sagittal computed tomography (CT) scan at the left hilum demonstrating an oval density due to left hilar nodes which contribute to the doughnut sign on the lateral radiograph, completing the ring inferiorly.

Another feature suggestive of lymphadenopathy on the lateral radiograph is the presence of a lobulated density inferior and posterior to the bronchus intermedius representing subcarinal and retrocarinal lymphadenopathy.<sup>3</sup>

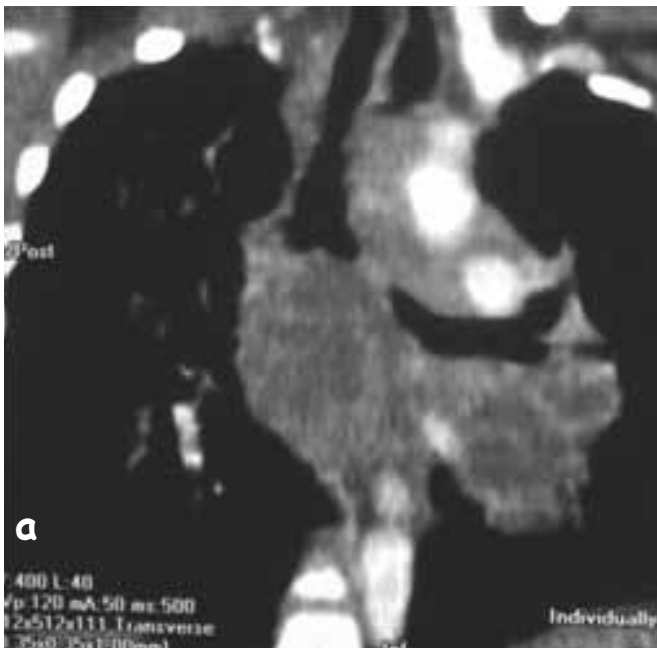
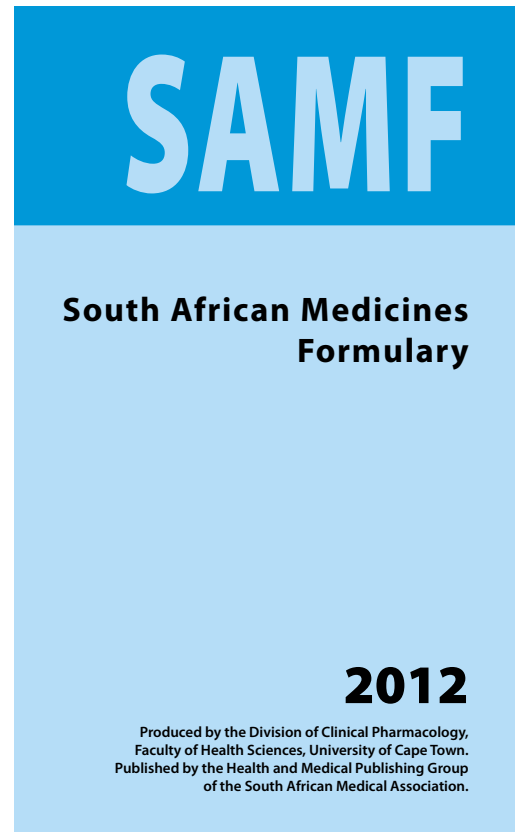


Fig. 3. Coronal (a) and axial (b) CT scan demonstrating left hilar and subcarinal lymphadenopathy.

#### References

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2. Algin O, Gokalp O, Topal U. Signs in chest imaging. *Diagn Interv Radiol* 2011;17:18-29.
3. Andronikou S, Vanhoenacker FM, De Becker AI. Advances in imaging chest TB: Blurring of differences between children and adults. *Clin Chest Med* 2009;30:717-744.



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