

# Broken Eggshell Sign: A Marker of Aggressive Thyroid Cancer

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## ABSTRACT

Broken eggshell calcification on CT scan of the neck represents malignant transformation of a longstanding benign thyroid nodule. It usually implies aggressive cancer and poor prognosis. The presence of a soft tissue component on the scan increases the sensitivity and specificity of the sign. We report three cases with the representative CT images to illustrate the sign.

**Keywords:** Broken eggshell calcification, Aggressive thyroid cancer.

**How to cite this article:** Sekar S, Chandramohan A, Ramakant P, Abraham DT, Paul MJ. Broken Eggshell Sign: A Marker of Aggressive Thyroid Cancer. *World J Endoc Surg* 2016;8(2): 183-184.

**Source of support:** Nil

**Conflict of interest:** None

## INTRODUCTION

Interrupted eggshell calcification has been reported as an alarming sign of malignancy in ultrasound studies<sup>1,2</sup> and a single case report of computed tomography (CT) scan.<sup>3</sup> We present three patients with this sign noted on CT scan of the neck all of whom had advanced thyroid cancer.

## CASE REPORTS

### Case 1

A 60-year-old woman diagnosed with poorly differentiated thyroid carcinoma and lung metastases had CT scan of the neck which is shown in Figures 1A and B.

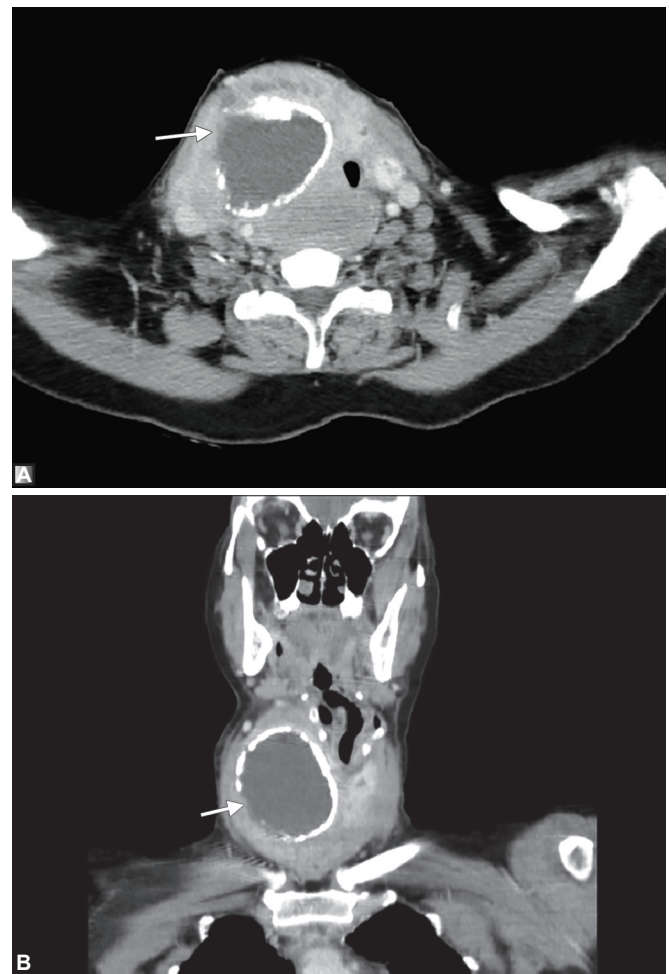
### Case 2

A 55-year-old woman had multiple vertebral and lung metastases from papillary carcinoma classic type with cracked eggshell sign in CT (Fig. 2).

### Case 3

A 65-year-old man diagnosed with anaplastic thyroid carcinoma invading aerodigestive tract had the interrupted eggshell calcification in CT (Fig. 3).

“Disrupted”, “interrupted” or “broken eggshell” calcification is caused by tumor invasion into the calcified rim.<sup>2</sup> It has good diagnostic accuracy (greater than 75%) of malignancy with 81.5% specificity and even greater when there is soft tissue outside the rim with sensitivity 92.2 and 88.8% negative predictive value.<sup>1</sup> This sign is commonly associated with advanced malignancy and distant metastasis and may be considered as a poor prognostic sign.<sup>3,4</sup>



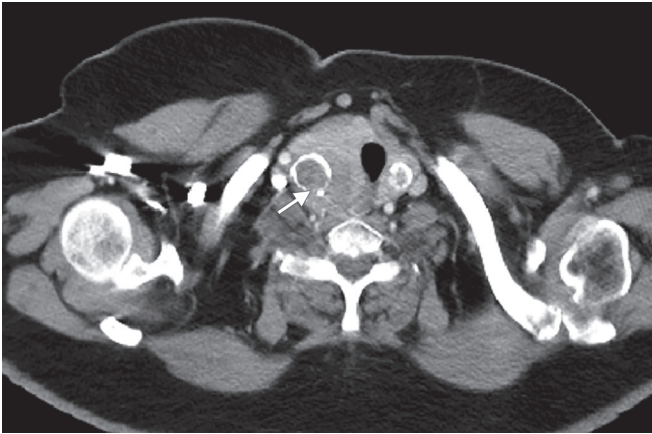
**Figs 1A and B:** (A) Computed tomography contrast axial view—arrow pointing disrupted eggshell sign; and (B) CT coronal view—arrow pointing eggshell cracking sign

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**Fig. 2:** Computed tomography axial view with rim calcifications in both lobes, arrow pointing disrupted calcification



**Fig. 3:** Computed tomography axial view showing right lobe thyroid replaced with dense calcification with rim interruption (arrow)

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