



## CLINICAL IMAGES

## Imaging of carotidynia

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Carotidynia (or carotodynia, -dynia from the Greek *odyn* meaning pain) is defined in *Dorland's Illustrated Medical Dictionary* as an episodic, usually unilateral neck pain with tenderness along the course of the common carotid artery. The term 'carotidynia' currently implies an idiopathic benign self-limiting condition of unilateral neck pain and tenderness localised to the region of the carotid bifurcation and proximal extracranial internal carotid artery. Here we present a pictorial essay of magnetic resonance (MR) images from a number of cases that we have encountered over a 4-year period. In all cases the primary diagnosis of carotidynia was made (or suggested) on the basis of the above definition together with the absence of any other positive clinical, serological, radiological or other features suggestive of an alternative cause for the cervical pain. As expected, most of the patients responded well to a course of non-steroidal anti-inflammatory drugs, some requiring a short course of oral steroids as well. Some patients developed recurrent symptoms, but all generally fitted the criteria for the diagnosis of idiopathic carotidynia.

### Case reports

#### Case 1

A 40-year-old woman presented with a history of recurrent localised pain on alternating sides of her neck over a 2-year period. The pain and tenderness were localised to the right side at the time of this MR scan. This patient had undergone many other investigations, all of which had proved negative. The MR scan shows slight thickening around the right carotid artery on T1-weighted images (Fig. 1a, arrow) and a thin bright signal on the STIR images (Fig. 1b, arrow). Intravenous gadolinium was not given.

#### Case 2

A 39-year-old man presented with recurrent right-sided neck pain aggravated by yawning, swallowing and neck movement, with direct tenderness over the carotid bifurcation clinically. All

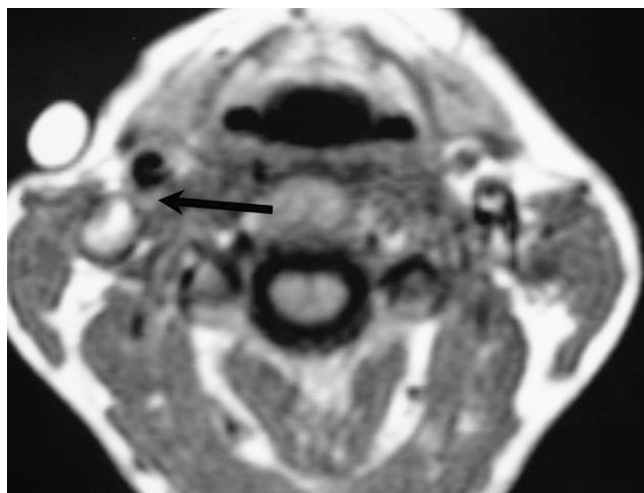


Fig. 1a. Unenhanced axial T1-weighted MR image obtained at the point of maximal clinical tenderness (note skin marker). The arrow indicates periadventitial thickening around the carotid artery.

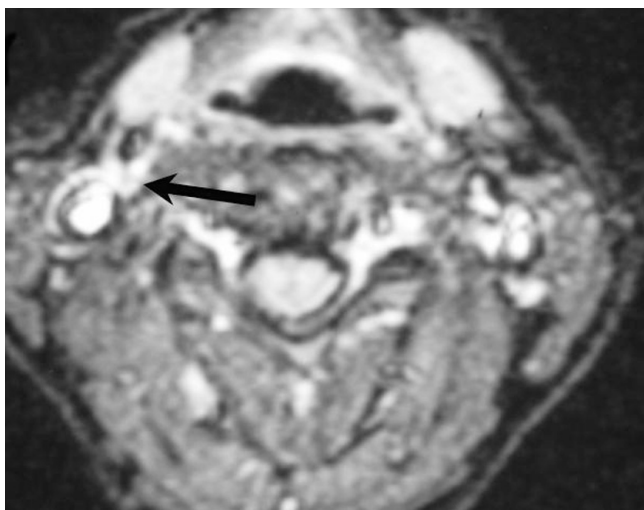


Fig. 1b. Axial STIR image at the same level showing a thin layer of increased periadventitial signal compatible with fluid or inflammatory oedema (arrow).

other investigations proved negative. An initial MR scan (now lost) reported thickening of the wall around the right carotid artery. The pain responded well to oral prednisolone. This follow-up scan done 13 months after the initial presentation shows persistent thickening on T1-weighted images (Fig. 2a, arrow) and increased signal (fluid) on T2-weighted images (Fig. 2b, arrow) although to a lesser degree than seen previously.

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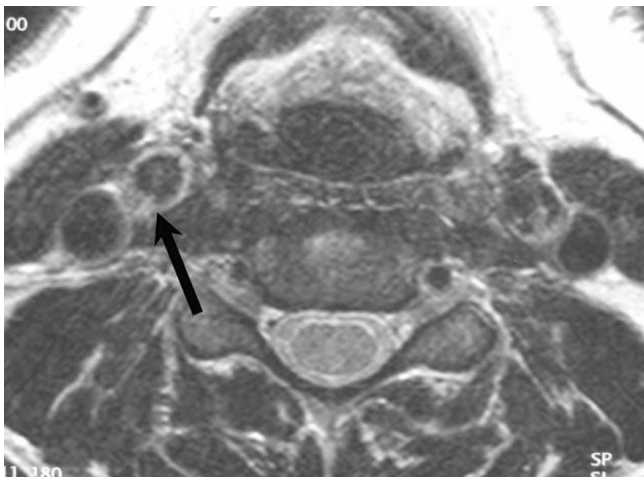


Fig. 2a. Unenhanced axial T1-weighted MR image obtained during a follow-up scan 13 months after the initial presentation shows residual periadventitial thickening (arrow).



Fig. 3a. Unenhanced axial T1-weighted MR image showing mild periadventitial thickening (arrow).

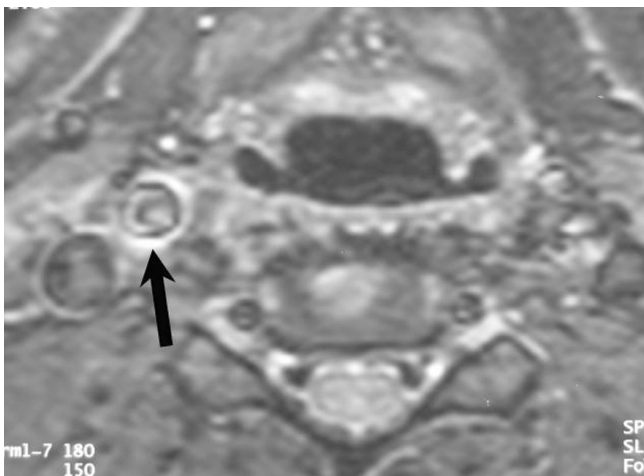


Fig. 2b. Axial T2-weighted image at the same level shows a thin layer of periadventitial fluid (arrow). The patient was clinically asymptomatic at this stage.

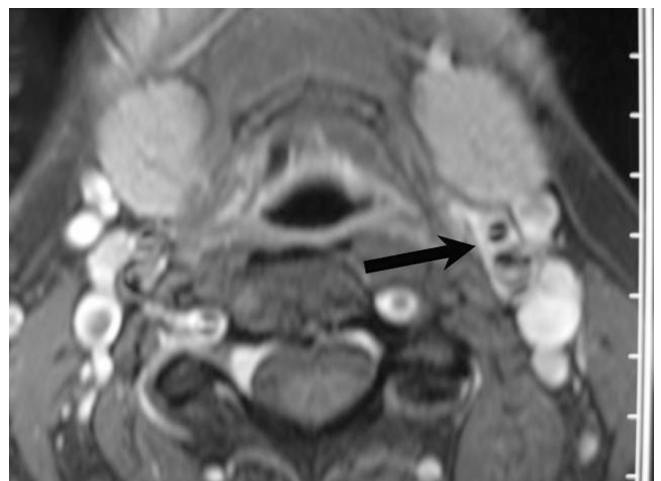


Fig. 3b. The same tissue shows mild enhancement after intravenous gadolinium administration (arrow).

### Case 3

A 41-year-old woman presented with painful swelling of the left side of her neck with marked tenderness over the left carotid bifurcation. An initial computed tomography (CT) scan proved negative. The later MR scan shows mild thickening (Fig. 3a, arrow) and contrast enhancement (Fig. 3b, arrow) of the tissues around the left carotid bifurcation. The pain responded well to a course of non-steroidal anti-inflammatory drugs.

that showed mild enhancement after gadolinium injection (Fig. 4b, arrow). He responded well to a course of non-steroidal anti-inflammatory drugs.

### Discussion

The term 'carotidynia' was first used by Fay in 1927 to describe a clinical finding of localised tenderness over the carotid bulb (Fay's sign).<sup>1</sup> In 1967, Roseman defined carotidynia as a distinct syndrome of unilateral neck pain aggravated by lateral head movement, chewing and swallowing, that was also reproducible by digital compression of the involved carotid segment.<sup>2</sup> The pain is usually unilateral (in more than 90% of cases), may be mild or severe, intermittent or constant, and throbbing or stabbing in nature. It can be exacerbated by yawning, coughing, sneezing, swallowing or turning the head, and is not accompanied by other

### Case 4

A 41-year-old man presented with pain, swelling and tenderness over the left carotid artery. All other investigations proved negative. MR scanning showed a mantle of thickened tissue around the distal left common carotid artery and carotid bifurcation on non-enhanced T1-weighted images (Fig. 4a, arrow)



Fig. 4a. Unenhanced axial T1-weighted MR image shows a thick rim of abnormal periaortic tissue (arrow).

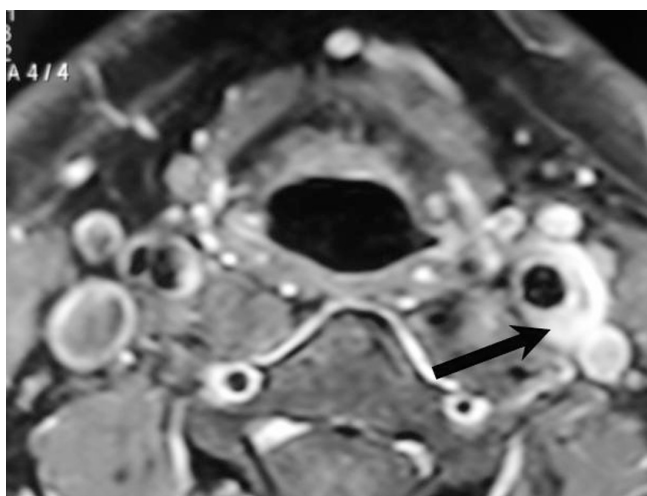


Fig. 4b. Contrast enhancement is seen within the same tissue (arrow).

constitutional symptoms such as chills or fever. The tender area typically extends for 1 - 2 cm. No bruits are audible. The pain usually lasts for up to 2 weeks but can last for several weeks to months. Most cases respond well clinically to a course of non-steroidal anti-inflammatory drugs, with some only responding when steroids are added to the treatment regimen. Local heat application can also provide symptomatic relief.

There are a large number of differential diagnoses for unilateral neck pain which includes vascular causes such as acute dissection, giant-cell arteritis, atherosclerosis, thrombosis, fibromuscular dysplasia, migraine and aneurysm formation, and non-vascular causes such as lymphadenitis, cervical degenerative joint disease, oral and pharyngeal inflammation, abscess, sialadenitis, thyroiditis, myositis and various head and neck tumours. Most of these can be excluded by a thorough history,

**Table I. International Headache Society Classification Committee criteria for the diagnosis of idiopathic carotidynia**

At least one of the following overlying the carotid artery:
Tenderness
Swelling
Increased pulsations
Appropriate investigations not revealing any structural abnormality
Pain over the affected side of the neck; may project to the ipsilateral side of the head
A self-limiting syndrome of less than 2 weeks' duration

careful examination, appropriate laboratory tests and imaging studies. The International Headache Society Classification Committee criteria for the diagnosis of idiopathic carotidynia are listed in Table I. One criticism of these criteria is that in some cases the pain can last well beyond 2 weeks and yet fulfil all of the other diagnostic criteria.<sup>1,2</sup> In a highly critical article published in 1994 Biousse and Bousser<sup>3</sup> chose to debunk the existence of the entity of idiopathic carotidynia, a view that has persisted in medical practice for many years since. However, several more recent articles<sup>4,5</sup> have described the presence of specific positive imaging features using MR imaging in patients with carotidynia. These include the presence of abnormal contrast-enhancing tissue surrounding the symptomatic carotid artery centred at the level of the carotid bifurcation within the carotid sheath for a variable length of between 15 mm and 35 mm. In addition to this contrast enhancement, increased signal intensity may be seen in the same region on T2-weighted images. Other causes for ipsilateral neck pain were excluded in all cases described. In 2003, Upton *et al.*<sup>6</sup> reported the histological findings of a biopsy specimen taken from the adventitia and periaortic tissue of the carotid artery in a man who underwent an elective carotid endarterectomy. This patient had co-incidentally been complaining of localised neck tenderness for several days before the surgery, and fitted the diagnostic criteria for carotidynia. Thickening and oedema of the adventitia of the carotid artery were noted at surgery. Histological examination showed a low-grade chronic inflammatory process with associated proliferation of vessels and fibroblasts, which the authors concluded was histological confirmation of carotidynia. No organisms were cultured. These recent reports therefore add credence to the entity of carotidynia as a self-limiting perivascular inflammatory disorder, the cause of which as yet remains unknown.

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