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Clinical Record

Internal carotid artery dissection following canalith repositioning procedure

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Abstract

Objective: To highlight the possibility of internal carotid artery dissection following canalith repositioning procedures.

Case report: A 52-year-old woman with right posterior canal benign paroxysmal positional vertigo sustained a right carotid artery dissection following a canalith repositioning procedure. The patient also had profound mixed hearing loss associated with otosclerosis, so underwent simultaneous cochlear implantation and occlusion of her posterior semicircular canal, following completion of anticoagulation therapy for her dissection.

Conclusion: While internal carotid artery trauma is a rare adverse outcome following canalith repositioning procedures, clinicians should be aware of this possibility if patients report unusual symptoms following such procedures.

Key words: Positional Vertigo; Neck; Physical Therapy; Internal Carotid Artery Dissection

Introduction

Canalith repositioning procedures are indicated for the treatment of benign paroxysmal positional vertigo (BPPV),[1] and involve manipulation of the patient's head and neck. While there is ongoing debate by manual therapists as to the safety of cervical spine manipulation,[2] treatment of balance disorders by canalith repositioning has not been known to cause arterial injury. However, our patient sustained such an injury following the Epley manoeuvre.[1]

Case report

Our patient had suffered BPPV for many years and had undergone several canalith repositioning procedures, which had brought about significant, albeit temporary, symptom improvement. She had also suffered progressive, bilateral mixed hearing loss over 20 years, associated with otosclerosis, and had had profound hearing loss over the last 12 years. She had undergone a stapedectomy to her right ear in February 2006 with no hearing improvement, and was subsequently referred for cochlear implantation. Her past history included a cystectomy in 1997 for a bladder tumour.

In April 2006, the patient attended a physiotherapy balance clinic. A Dix–Hallpike test demonstrated findings consistent with right posterior semicircular canal BPPV. A canalith repositioning procedure (Epley manoeuvre)[1] was then performed by an experienced balance physiotherapist. While this was being performed, the patient complained of tingling in her lips and left arm, with decreased strength of her left hand.

The patient was transferred to the emergency department, and magnetic resonance angiography (MRA) was performed later that day. This demonstrated a dissection of the right internal carotid artery (Figure 1).

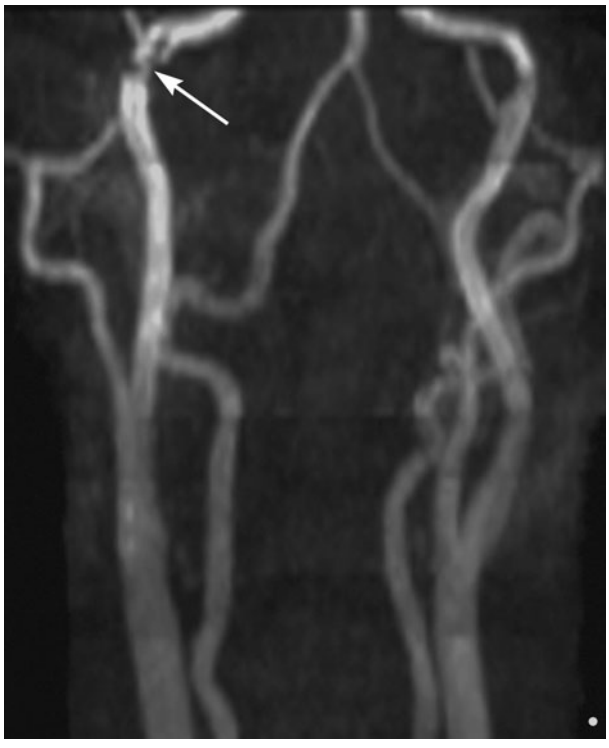

Fig. 1

Coronal magnetic resonance angiography of the cervical arteries. Arrow indicates dissection flap within the right internal carotid artery.

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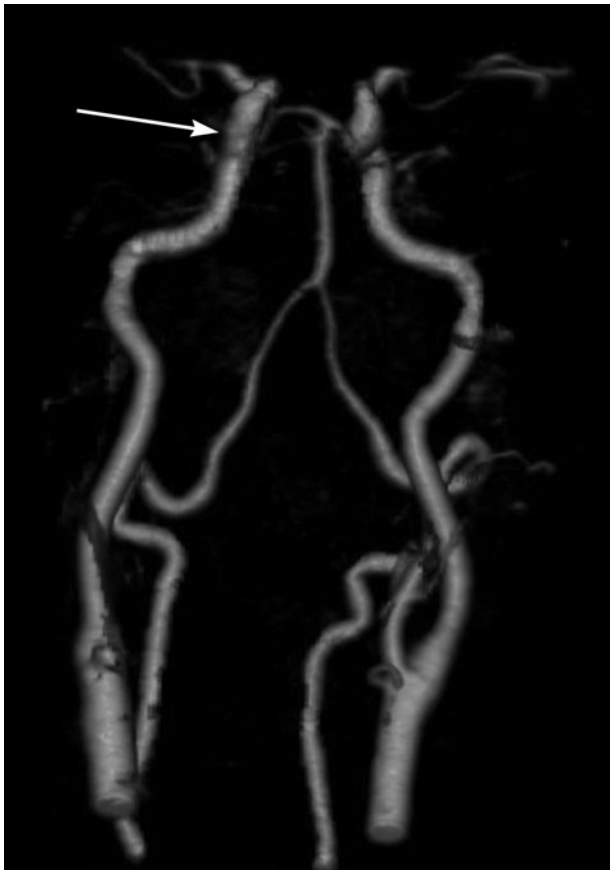

FIG. 2
Coronal computed tomography angiography of the cervical arteries taken 17 months after the injury, demonstrating no residual dissection flap.

The patient underwent heparin and then warfarin anticoagulation, and had no further neurological events. Her paraesthesia settled but she continued to have residual weakness of her left hand. This weakness had resolved when she was seen four months later.

- **Canalith repositioning is indicated for benign paroxysmal positional vertigo (BPPV)**
- **Carotid artery dissection following canalith repositioning procedures is a rare adverse outcome**
- **Semicircular canal occlusion is useful for refractory BPPV or in patients in whom canalith repositioning is contraindicated**

Repeated MRA examinations at three and eight months demonstrated persistent focal vessel narrowing, with a flap across the horizontal portion of the internal carotid artery.

Cochlear implantation for the patient's profound hearing loss was delayed until warfarin was able to be ceased, 10 months post-dissection. At this stage, she was commenced on low dose aspirin.

The patient proceeded to left cochlear implantation in February 2008. The day prior to her operation, Dix–Hallpike testing indicated left posterior semicircular canal BPPV; thus, at the time of surgery she underwent simultaneous left posterior semicircular canal occlusion. Intra-operatively, particles were clearly seen inside the lumen of the patient's posterior semicircular canal.

Post-operatively, the patient achieved significantly improved speech perception and had no further episodes of vertigo.

Computed tomography angiography undertaken in September 2008 did not demonstrate any residual dissection (Figure 2).

Discussion

Canalith repositioning procedures have successfully been utilised for the treatment of BPPV since the early 1990s.[1] While there have been cases of carotid artery dissection following cervical spine manipulation,[2] and even occurring spontaneously,[3] there have been no reported cases of carotid artery dissection following canalith repositioning procedures. While dissection is a rare adverse event following canalith repositioning procedures, it is potentially very significant and clinicians should be aware of this possibility when performing such procedures. It is difficult to determine whether patients who are otherwise at risk of arterial dissection due to conditions such as an enlarged aortic root diameter or migraine[4] should be cautioned against canalith repositioning; the complication rate for this procedure is low, and in our patient's case there were no known risk factors. Anticoagulation remains the first line treatment of choice for carotid artery dissection, although endoluminal stenting may be appropriate in selected cases.[5] Semicircular canal occlusion is an option in patients repeatedly affected by BPPV in whom canalith repositioning is not successful or is contraindicated, as in this case.

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