

Spontaneous recanalization after carotid artery dissection: think outside the tubes

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Dissection of the internal carotid artery (ICA) accounts for 5% of ischemic strokes in young adults. Initial and follow-up evaluation of the extra-cranial and intracranial vascular systems can be performed with carotid duplex (CD) and transcranial color – coded duplex ultrasound (TCCD). We report a case of spontaneous recanalization of traumatic ICA dissection.

A 47-year-old male presented with intermittent episodes of headache, blurry vision, anisocoria and loss of taste sensation following whiplash injury during body surfing. Magnetic Resonance Angiogram (MRA) of the neck revealed absent flow in the cavernous ICA and a clot at skull base. Carotid Duplex showed reverberating color doppler and spectrum signal. TCCD showed ICA occlusion and smaller caliber intracranial ICA.

After 1 month being on anticoagulation therapy, patient reported for follow up examination after his headache subsided. CD and TCCD were normal and ICA showed normal color and spectrum signals. Computer Tomography Angiogram confirmed ultrasound findings. Dramatic improvement of ICA patency and symptoms resolution were co-found.

Occlusion of the internal carotid artery due to dissection can recanalize spontaneously. Extra-cranial carotid duplex and TCD examination are useful for monitoring patient progress. These inexpensive and non-invasive modalities are an alternative to invasive angiogram and provide more hemodynamic information than “static” MRA.

INTRODUCTION

The ongoing improvement of neuroimaging techniques has made it increasingly possible to recognize the frequency of cervical carotid artery dissection. The incidence of internal carotid artery (ICA) dissection is 2.5-3 per 100 patients per year [1, 2]. Some cases are asymptomatic or only cause minor symptoms and therefore the true incidence may be even higher. Carotid artery dissection is responsible for 2.5-5% of all ischemic strokes and 5-25% of strokes in young patients [1, 3, 4]. In the late 1970s Fisher et al. recognized the clinical and radiological features of dissection synd-

romes [4]. Dissections may occur due to direct, blunt or even minor trauma of the neck. If there are no detectable underlying reasons, spontaneous dissection is diagnosed, although more intrinsic or environmental “risk” factors may exist [5]. Internal carotid artery dissection causes carotid territory ischemia typically present with unilateral headache, facial or neck pain, Horner syndrome, rare cranial nerve palsy, pulsatile tinnitus, and retinal ischemic symptoms, different types of aphasia [6].

Clinical diagnosis can be challenging in these patients. The importance of early recognition and management is aimed at the prevention of ischemic cerebrovascular complication. Initial and follow-up evaluation of the extra-cranial and intracranial vascular systems can be performed with carotid duplex (CD) and transcranial color-coded duplex ultrasound (TCCD) [7].

Here we report a case of spontaneous recanalization of a traumatic ICA dissection.

CASE REPORT

A 47-year-old male presented with intermittent episodes of headache, blurry vision, anisocoria and loss of taste sensation following whiplash injury during body surfing. Pressure on the right side of the face and behind the right eye started shortly, and later he experienced soreness in the neck. Two days later light flashes in both eyes (even when eyes closed) appeared temporarily. On the fourth day anisocoria prompted him to present to an ophthalmologist, who determined that symptoms were not due to an eye-related issue. Sinus infection was also excluded by further investigation. CAT scan was negative, showing no bleeding. A week after the injury patient experienced acute loss of sense in the anterior of the tongue. After neurological investigation, brain, orbit and neck MRI with contrast and head and neck Magnetic Resonance Angiogram (MRA) were performed. MRA of the neck revealed absent flow in the cavernous ICA and a clot at the skull base (figure 1.). Carotid duplex showed a reverberating color Doppler and spectrum (figure 2.). TCCD showed ICA occlusion and smaller caliber intracranial ICA. A thrombus was noted in the ICA at the site of the dissection, therefore the patient was treated with warfarin and enoxaparin (figure 3.).



Figure 1.
ICA occlusion on Neck MRA
arrow: occluded ICA

After one month being on anticoagulation therapy, patient reported for follow-up examination after his headache subsided. CD and TCCD were normal and ICA showed normal color and spectrum signals. Computer Tomography Angiogram confirmed ultrasound findings. Dramatic improvement of ICA patency and symptoms resolution were co-found (figure 4., 5., 6.).

DISCUSSION

Although carotid artery dissection is a significant cause of stroke in young patients, the diagnosis can be difficult. In our case the patient presented with the classical triad of unilateral head and neck pain with Horner syndrome and retinal ischemia [1, 4]. Most patients have symptomatic relief as soon as the first week, in our case the headache resolved after one month.

In most of the cases carotid artery dissections heal spontaneously. Follow-up studies have reported recanalization of occlusions in 33-50% of the patients [1, 5]. Nedeltchev et al. in a prospective observational study found complete recanalization of spontaneous carotid artery dissection in 160 cases from 268 patients (60%). The likelihood of achieving complete recanalization in 1, 3, 6, and 12 month follow-up was 15.7% at the first month, 50.4% at 3 month and 59.7% at 6 and 12 months. After 6 months, recanalization rarely can be seen [8]. Patients with mild and local symptoms and

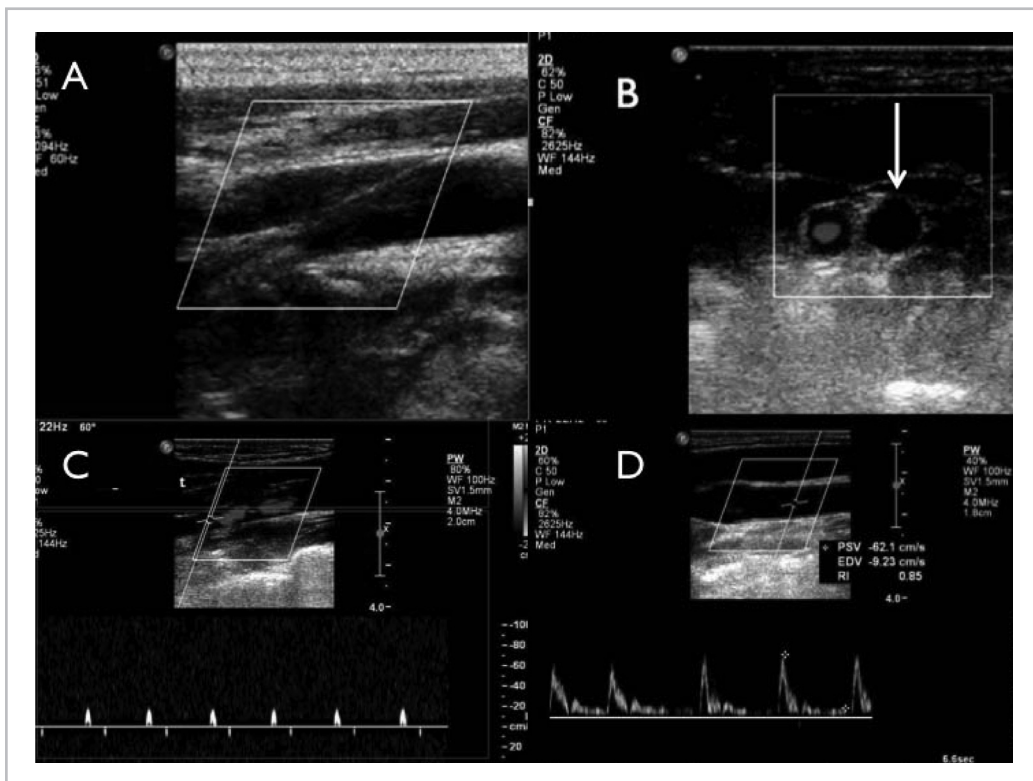


Figure 2.
Right ICA occlusion longitudinal view(A), cross section view (B), ICA spectra waveform (C), CCA waveform(D)
b white arrow: absent color doppler signal of the ICA
c high resistance spikes (to-fro waveforms) in the ICA
d high resistance waveform in the CCA

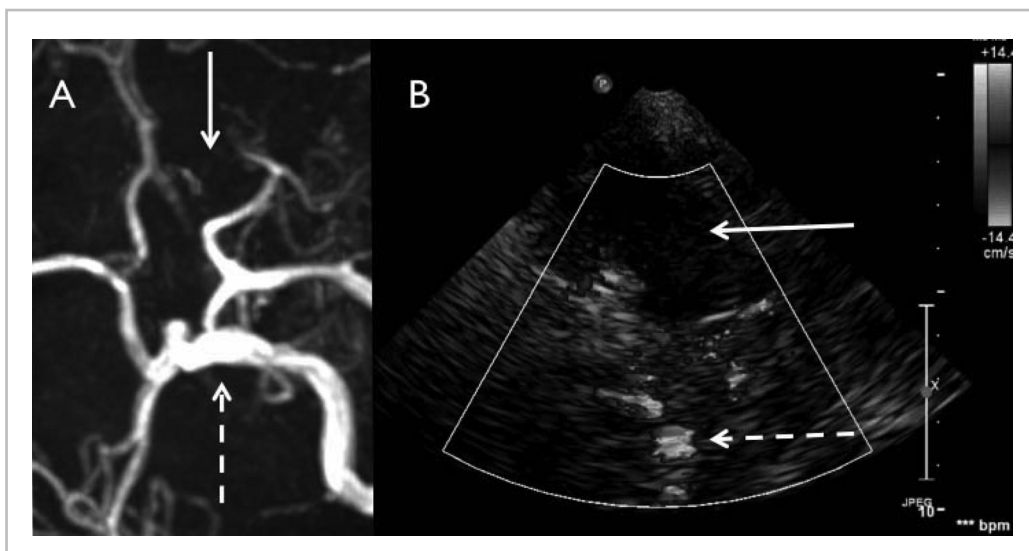


Figure 3.
Right ICA occlusion on MRA(A) and on TCCD (B)
arrow: absent ICA

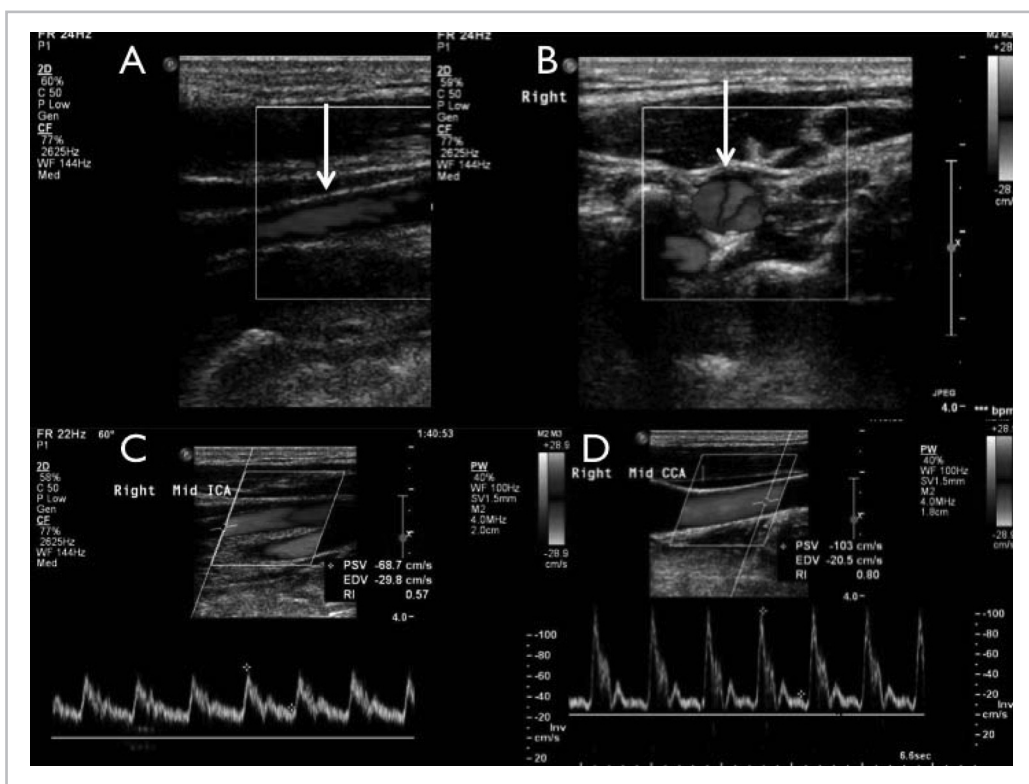


Figure 4.
ICA recanalization longitudinal view(A), cross section view (B), ICA spectra waveform (C), CCA waveform(D)
a-b color doppler signal present in ICA
c low resistance waveform in the ICA
d normal waveform in the CCA

signs have a much more favorable prognosis and the complete recanalization occur more often [1, 5].

The aim of management is to limit neurological deficits by reducing the risk of thromboembolic complications. The choices for treatments are thrombolysis, antithrombotic treatment with anticoagulation or antiplatelet therapy and endovascular

interventions. In the absence of randomized clinical trial data, treatment consideration must be made on a patient-specific basis [4, 9-11]. The risk of a recurrent dissection are relatively rare, about 2% within the first month and 1% annually, but in a prospective Canadian study by Beletsky at al. relatively high recurrence rate of 10,4% was found [2].

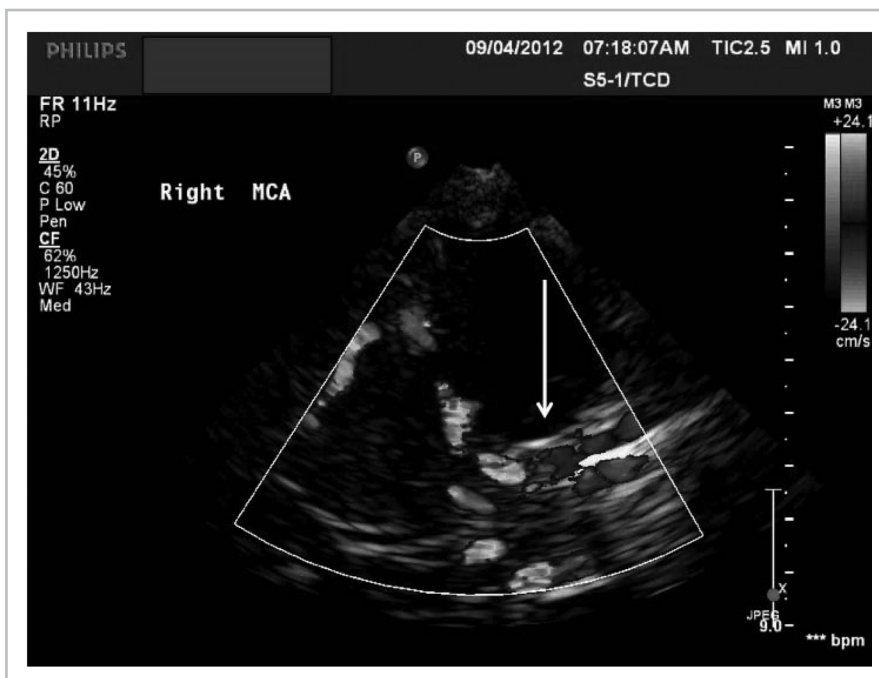


Figure 5.
Recanalized ICA on TCCD

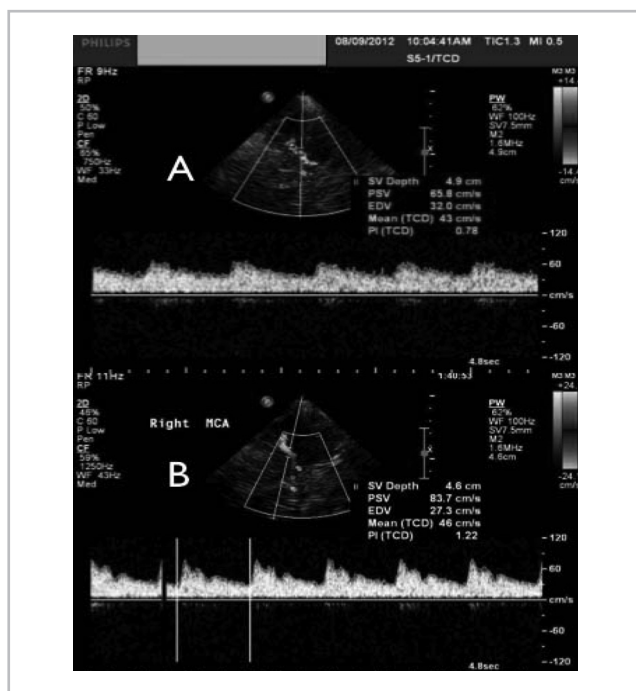


Figure 6.
a (baseline on 8.09.2012) blunted MCA signal at 49 mm depth
b (post recanalization on 9.04.2012) normal waveform with straight systolic upstroke

Follow-up noninvasive vascular imaging can include extra-cranial carotid duplex and TCD examination for monitoring patient progress and to document healing of the dissection before cessation of anticoagulant therapy. These inexpensive and non-invasive modalities are an alternative to invasive angiogram and provide more hemodynamic information than “static” MRA.

CONCLUSION

This case highlights that traumatic dissection of the extracranial carotid arteries which, originally thought to be a rare clinical event, can also affect young, fit and healthy subjects following relatively minor trauma. Early imaging with noninvasive and reproducible imaging techniques can result in accurate diagnosis and follow-up. The key therapeutic issue is markedly reducing ICA dissection related stroke rate.

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Sajtóközlemény

Kulcslyuksebészeti bemutatóműtét az Országos Onkológiai Intézetben

2013. szeptember 26-án, az Országos Onkológiai Intézetben találkoztak a magyar mellkassebészek, hogy a minimal invazív mellkassebészet aktuális kérdéseiről értekezzenek, és közösen tekintsenek meg online műtői közvetítés segítségével, egy kulcslyuksebészeti módszerrel elvégzett tudóműtétet.

Az ülést Prof. Dr. Kásler Miklós, az intézet főigazgatója nyitotta meg, majd Dr. Gajdácsi József, az OEP főigazgató-helyettese ismertette a szakma finanszírozásban várható pozitív változásokat. A rendezvény meghívottja volt Prof. Rene Petersen, világhírű dán mellkassebész, a kulcslyuksebészet úttörője.

Óriási előnye a kulcslyuksebészeti módszernek, hogy jelentősen kisebb a műtét utáni fájdalom, rövidebb a kórházi tartózkodás, és természetesen hamarabb elkezdhet dolgozni a páciens. Örömmel állapították meg a résztvevők, hogy a magyar mellkassebészet továbbra is a nemzetközi élvonalba tartozik, amihez természetesen elengedhetetlenül szükséges a megfelelő intézményi és finanszírozási támogatás.

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