
D Smith et al reply:
We thank Mr Wilden for his interest in this article. Whilst recognising minor problems with some of our definitions, we would like to emphasise that this was a retrospective study which generates a simple hypothesis demanding prospective testing.

We agree that definitions of "early" and "late" surgery have not been agreed upon and that our own definitions, of necessity, are somewhat arbitrary. They do, however, allow the essential differentiation between those patients receiving surgery soon after diagnosis and those in whom surgery is delayed until a change in clinical status occurs. Furthermore, by using an intention to treat analysis, we avoided bias against the effectiveness of surgery as a whole by excluding patients whose surgery was performed because of neurological deterioration.

With regard to the type of surgery—resective surgery refers to procedures which involve debulking of the tumour and non-resective to biopsy or drainage of cysts. As Mr Wilden states, we have not subdivided resective surgery according to whether or not the surgeon considered the resection to be complete or partial. However, this information is difficult to obtain from a retrospective review of case notes and is not likely to be reliable. Furthermore, whilst accepting that this issue may be relevant in a minority of patients, with well circumscribed temporal or frontal lobe tumours, it is well recognised that resections "considered" to be total macroscopically are rarely confirmed on histopathological specimens, and many pragmatic neurosurgeons would concede that total excision of infiltrative gliomas, often involving more than one lobe, is not possible.

Mr Wilden has answered his second query himself. We would, however, like to emphasise that it was never our intention to conduct sub-group analyses, in small numbers of patients, and it is well known that such analyses on retrospective data yield unreliable results that are very difficult to interpret.

His final remarks merit two comments. Firstly, we would like to reiterate that we made every effort not to over-interpret our data and our intention was simply to generate a testable hypotheses and certainly not the development of "definitive management policies". Secondly, we maintain that our reply and Mr Wilden’s comments on the need for a national database derived from individual centres inevitably employing different treatment regimes. Data collected in this way would not allow development of satisfactory management policies and the necessary information can only be obtained, as we state clearly in our final paragraph, from a well designed, multicentre, prospective randomised trial comparing conservative and aggressive management policies.

Extracranial vertebral artery dissection
We would like to make several comments about the recent report by Hinse et al on extracranial vertebral artery (VA) dissection:
1) This article is based on 4 personal cases and a review of 53 published cases. However, several published reports, including 2 recent studies on a total of 38 cases, are not quoted, which may give the impression that VA dissection is rare. In 1988, Hart estimated that nearly a hundred cases of VA dissections had appeared in the English language literature in the past decade and that between 0-5 and 2-5 cases per year were reported from large referral-based hospitals. 2) We have come to similar conclusions in our own work on the subject regarding symptoms and prognosis of this disorder. The authors, however, do not mention in their discussion that VA dissection may be asymptomatic and possibly discovered when exploring a concomitant carotid artery dissection. They point out that there is a high incidence of bilateral VA dissection but do not mention the possibility of simultaneous occurrence of vertebral and internal carotid artery dissections, which is not infrequent particularly in patients with spontaneous dissection. The frequency of multivessel dissection implies that four-vessel exploration (by angiography or other method) should always be attempted if a VA dissection is demonstrated.
3) The diagnosis of dissection relies classically on angiography, which reveals irregular stenosis, pseudoaneurysm, occlusion, or double-lumen. Of these features, the only pathognomonic one (but also the rarest) is the double lumen. Occlusion which can be due to thrombosis of any cause is the least specific. We think that the diagnosis of probable occlusive form of VA dissection can only be made when there is angiographic evidence of dissection in the other VA or in the internal carotid artery. In this respect, the diagnosis of dissection in patients 2 and 3 of Hinse et al who had VA occlusion should only be regarded as possible.
4) Normalisation or improvement of angiographic abnormalities is frequent in this condition and is an excellent argument in favour of the diagnosis. In one of our cases, marked improvement was observed as early as 7 days after the first angiogram, which stresses the point that the first angiography should be performed as early as possible so that the diagnosis should not be overlooked. We also concluded that control angiography could be performed around the third month, a time by which most dissected vertebral arteries had returned to normal.
5) In our opinion, ultrasound examination...
can not only show "some abnormality that encourages angiographic examination" but can also diagnose dissections involving the perivasculare, C6-C5 and C5-C4 intertransverse segments of the VA. The diagnosis is based on the association of a localized increase in arterial diameter with haemodynamic signs of stenosis or occlusion and/or decreased pulsatility and intravascular echoes at the same level. Furthermore, ultrasonic examination is an excellent tool for the follow-up of dissection.

6) Among other diagnostic procedures, the authors did not mention thin-section contrast CT scan and MRI. By virtue of its sensitivity to both blood flow and thrombus formation, its multiplanar imaging capability, and its noninvasiveness, MRI (and especially magnetic angiography) is becoming the imaging modeality of choice for the evaluation of suspected carotid or vertebral dissection (fig). At present, however, MRI does not assist in distinguishing between intraluminal and intramural thrombus and therefore does not allow the diagnosis of occlusive forms of vertebral dissection.

7) The relation of trauma to dissection is a complex issue. Hinse et al. considered their patient as an example of traumatic (chiropractic) manipulation dissection. We recently reported the case of a woman with a 3 week history of cervical pain who developed sciasma, 3 days after a basilar territory following cervical manipulation. Neuroscope revealed a VA dissection, a recent one probably due to cervical manipulation and a second one, a few weeks old, accounting for the initial cervical pain. This case demonstrates that cervical pain that precedes and motivates chiropractic manipulation may be the first symptom of a hitherto unrecognized spontaneous (or traumatic) dissection and illustrates the difficulty in classifying with certainty whether dissection is spontaneous or traumatic.

Apart from trauma and fibromuscular dysplasia, other conditions implicated as risk factors for dissection include migraine, oral contraceptives, and chronic high blood pressure. In a case control study, we found a significant positive association of dissection with migraine and current oral contraceptive use but not with hypertension. However, the mechanisms leading to this association remains speculative.

8) Finally, we agree that anticoagulants are not harmful in extracranial VA dissection and may even be of benefit although no conclusion can be drawn from the comparison of nonrandomised treatment groups.

Hinse et al. correctly state that dissection as a cause of arterial occlusion may be hard to diagnose. However, the angiographic appearance of tapering occlusion is highly suggestive of dissection. In our patients, complete recanalisation of a formerly occluded VA (cases 2 and 3) and visualisation of a small pseudoaneurysm (case 2) made the diagnosis of VA dissection highly probable. The value of ultrasound method in the diagnosis of VA dissection remains to be determined. Our own experience and the work of Touchboul et al. on three patients examined by duplex scan are too preliminary to allow any firm conclusions. As we have pointed out in our paper, ultrasound methods may be suitable for diagnosis of recanalisation, possibly obviating the need for repeated angiography in some patients. The same holds true for modern neuroimaging methods. Contrast-enhanced CT scan and MRI may corroborate the diagnosis of VA dissection, and are also increasingly recommended for follow up studies. However, both methods do not allow examination of the affected vessels in their entire length. These neuroimaging techniques will have to prove their value in a systematic study against the present "gold standard" (angiography).

The role of many presumably predispensing conditions, in particular migraine, use of oral contraceptives or hypertension, remains totally obscure. It is speculative whether some of these factors might act by merely facilitating the occurrence of stroke after dissection, but not dissection itself. It is also unknown why minor dissection may induce cervical dissections in some patients at any particular time or why recurrence in these patients is rare.