Case Report

Anterior spinal artery syndrome after peripheral angiography of the lower limbs

A Kürşat Bozkurt^{*1}, Ö Aydıngöz², L Yüceyar³ and S Tanrıverdi¹

¹Department of Cardiovascular Surgery, Istanbul, Turkey; ²Department of Orthopaedics, Istanbul, Turkey; and

³Department of Anaesthesiology, Istanbul University Cerrahpaşa Medical Faculty, Istanbul, Turkey

Study design: A case report of temporary anterior spinal artery syndrome secondary to peripheral angiography of the lower limbs.

Objectives: To report a rare case of spinal cord ischemia following a straightforward peripheral angiography with femoral access.

Setting: Istanbul, Turkey.

Case report: A 70-year-old patient with peripheral vascular disease developed temporary paraplegia after angiography caused by anterior spinal ischemia. His motor weakness improved gradually over a 2 month period.

Conclusion: Spinal complications are extremely rare after peripheral angiography. The possible mechanisms of spinal cord damage are discussed, and the relevant data regarding the etiology are reviewed.

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Introduction

Temporary paraplegia after peripheral angiography of the lower limbs has not been reported with the currently used nonionic contrast materials. A case is reported to illustrate the possible mechanism of the spinal ischemia in an otherwise uneventful procedure.

Case report

A 70-year-old male with critical limb ischemia of the left leg was admitted with paraplegia following elective peripheral angiography that had been carried out in a private radiology unit. His past medical history included colon resection because of carcinoma, and he had had colostomy for 2 years. Apart from this, there was no history of any other relevant medical illnesses. Under local anaesthetic and through a femoral stab, he underwent a peripheral angiography that revealed left common iliac artery occlusion. At the conclusion of the procedure he was fully alert, but he had started to complain of his inability to move both of his lower limbs. Neurological examination revealed motor weakness of his lower limbs with urinary retention. The

patient was responding to touch, pain, and temperature. There was no evidence of aortic dissection and protein C and protein S values were within the normal range. A magnetic resonance imaging scan showed a central high signal in the lumbar cord (Figure 1). The features were consistent with spinal cord ischemia in the distribution of the anterior spinal artery. He underwent a cross-femoral bypass procedure because of the limb threatening ischemia in the left foot. On follow-up, his muscle power in his lower limbs improved gradually over 2 months, from 0–1/5 to 3–4/5 on the muscle strength grading scale. He became ambulatory with some assistance and developed good bladder control. He passed away 6 months after the event because of myocardial infarction.

Discussion

More than 100 cases of spinal cord injury after aortography or angiography were reported until 1974.¹ Haertel *et al*² reported two cases of spinal cord injury from contrast damage among 4000 abdominal angiograms with an incidence of 0.05%. The introduction of nonionic contrast materials at the beginning of 1980 dramatically reduced the neurotoxicity. In various case

*Correspondence: AK Bozkurt, Ataköy 5. kısım A 7/40 34750, Istanbul, Turkey

Figure 1 Sagittal magnetic resonance imaging scan showing a diffuse area of high signal extending over several segments (arrow).

studies, spinal cord injury was reported following arcus aorta and brachiocephalic angiography, renal angiography, and coronary angiography.^{1,3} However, we were unable to find a single case of spinal cord damage following peripheral angiography of the lower limbs using modern contrast materials.

The blood supply to the spinal cord in the thoracolumbar region draws from the great radicular artery. This artery originates in the region of T9–T12 in approximately 75% of patients.⁴ Localization of this critical artery below the renal arteries is extremely rare. Tonz *et al*⁵ reported an incidence of paraplegia in only 0.19% of cases following 1070 reconstructive procedures of the infrarenal aorta.

Bacher *et al*¹ described several possible causes of neurological complication at angiography (Table 1). In the reported case, the tip of the catheter was located just below the renal arteries. The angiographer reported no difficulty in advancing the catheter and there was no sign of dissection. Hence, in the reported patient, the exact cause of the temporary spinal cord ischemia may only

Table 1 Causes of neurological complication at angiography (Bacher *et al*, *Spinal Cord* 1999; **37**: 172–182, with permission)

a. Catheter embolism (increased platelet aggregation)
b. Loosening of thromboembolic plaques by manipulation
c. Allergic reaction
d. Quantity of contrast medium
e. Kind of contrast medium (ionic, nonionic)
f. Duration of examination (> 80 min)
g. Localization of the vessel puncture

be speculative. Nonetheless, the critical lumbar artery supplying the lower spinal cord was thought to be located below the renal arteries. Embolism of this artery with thromboembolic plaques by manipulation was a possibility, but a permanent injury would be expected in this particular situation. That the contrast material induced damage is another likelihood, although non-ionic materials are considered to be safe. Picone *et al*⁶ reported some patients becoming paraplegic when perfusion pressure within the iliac artery was severely reduced. They stressed the importance of the internal iliac arteries to the blood supply of the spinal cord through the ilio-lumbar and lateral sacral vessels. In the reported case, the perfusion pressure within the internal iliac artery might have been reduced severely because of disturbance of the flow by the catheter itself. Damage to the collateral circulation in the previous colon resection would be the underlying reason for susceptibility of the spinal cord to the ischemic damage.

Conclusion

Without post-mortem examination, the exact cause of the temporary spinal cord ischemia in this particular case cannot be stated with certainty. However, all specialists caring for patients with peripheral vascular disease should be aware of the possibility of this complication.

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