

## MRI for follow-up after surgery for thoracic aorta dissection

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Received 4 August 2000; accepted 4 August 2000

*Keywords:* Cardiac; MRI; Aortic dissection

Advances in surgical techniques have considerably improved early survival after emergency repair for type A acute aortic dissection. The goal of surgery is to prevent intrapericardial rupture and to achieve resection of the intimal tear. Follow-up data document a high incidence of serious late postoperative complications in patients treated for acute type A aortic dissection. Almost all of these complications remain strictly asymptomatic. These findings justify careful long-term surveillance. MRI has proven to be highly effective for preoperative diagnosis of acquired thoracic aortic disease and several studies indicate that it also allows early detection and monitoring of postoperative complications.

The results of regular long-term follow-up of patients operated upon for type A dissection will be presented. MRI sequences used are standard SE T1 gated sequences, in both transaxial and oblique sagittal planes, routinely completed by 3D-gadolinium enhanced fast angiographic sequences.

Postoperative findings considered as normal include regular morphology of the aortic prosthesis, with full diameter of the prosthetic tube with no narrowing. Periprosthetic hematoma was found in almost all patients. When postoperative evolution was normal, its volume was small, moderate or progressively decreasing with homogeneous signal of intermediate intensity on T1 sequences, with no change after gadolinium injection. Normal evolution also includes no evidence of aneurismal evolution nor redissection on the native aorta. However persistent residual dissection distal to

the aortic graft with a patent false channel is a common condition after surgery for type A dissection. In a series of 57 patients who underwent emergent surgery for type A dissection in our institution (mean follow-up 75 months), normal long-term postoperative evolution was observed in 33 cases (58%), and persistent residual dissection of the native aorta was present in all patients but two.

MR follow-up allowed detection of complications in 42% of our long-term survivors. Periprosthetic false aneurysms account for half of them (12 patients). They are life-threatening conditions due to the permanent risk of sudden rupture. Their asymptomatic presentation suggests that surveillance is necessary in all patients who have undergone aortic surgery regardless of how long ago. False aneurysms are supposed to occur as a consequence of the dehiscence of the surgical suture. Their high incidence underscores the importance of carefully analyzing the signal from the periprosthetic hematoma and monitoring variations in volume. MRI presentation of false aneurysm includes heterogeneous signal intensity of periprosthetic hematoma, signal enhancement after gadolinium injection and, in about one half of the cases, direct visualization of the suture dehiscence. The persistence of a large hematoma could suggest that a suture dehiscence exists but is too small to be detected. In our experience almost half of the patients with large, non-regressive hematomas went on to develop false aneurysms. Regular surveillance could allow timely detection and careful selection of indications of reoperation. Surgical resection is the only curative treatment that could be proposed to such patients. Reoperation was undertaken in nine out of the 12 patients, with good clinical results in eight of them.

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and one death due to early postoperative myocardial failure. Intraoperative findings always confirmed MRI diagnosis.

Aneurysm in the native aorta is a common occurrence after surgical treatment of type A dissection. Aneurysmal dilatation of the aorta distal to the graft originated from the false channel, probably because of the poor condition of wall that was further weakened by dissection. MRI allowed assessment of topography and extension of the aneurysm, presence of partial thrombus within it, and visualization of its relations with the graft and collateral vessels. Regular MRI allows monitoring of the size of the aneurysm by comparison with the initial postoperative image and

scheduling of reoperation if necessary. In our institution, only evolutive aneurysms should be reoperated (four patients underwent repeated surgery for aneurysm of the native aorta in our series), because reoperation for partial or total replacement of the aortic arch or/and descending aorta includes high morbidity and mortality rates.

Conclusion: Routine MRI surveillance should improve long-term survival in patients that survive emergency surgical repair of type A aortic dissection. The findings of this study suggest that MRI is currently the method of choice for this surveillance. It allows early detection and elective reoperation of late complications that are often asymptomatic.