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Carotid Artery Aneurysm: A Case Study

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Introduction

A 60 year old male arrived at the emergency department after losing consciousness. CT showed he demonstrated a right hemispheric embolic stroke with a middle cerebral artery distribution. Upon further investigation, the patient was found to have a right common carotid artery aneurysm that extended about 1 cm from the carotid bifurcation into the internal carotid artery. The patient underwent carotid artery reconstruction with the use of his right great saphenous vein.

This case demonstrates an unusual form of cerebral embolization due to a internal carotid artery aneurysm.

Patient Description

The patient had a history of CVA, hyperlipidemia, hypertension, deep vein thrombosis, and melanoma. The patient is a former smoker although he has not smoked for ten years. Family history is significant for abdominal aorta aneurysm.

Results

The patient presented with a right hemispheric stroke. An ultrasound duplex was performed, and established there was a right side carotid artery bifurcation aneurysm extending into the internal carotid artery for about a centimeter. The maximal aneurysm size was 1.7 x 1.9 cm. Mural thrombus was present but no stenosis was demonstrated.

The patient underwent several additional studies: Cerebral angiography and computed tomography angiography (CTA). The CTA showed thrombus of the aneurysm; however, flow was patent through the vessel.

The patient underwent surgical reconstruction with a section of the patient's right great saphenous vein. There was no ICA stenosis demonstrated.

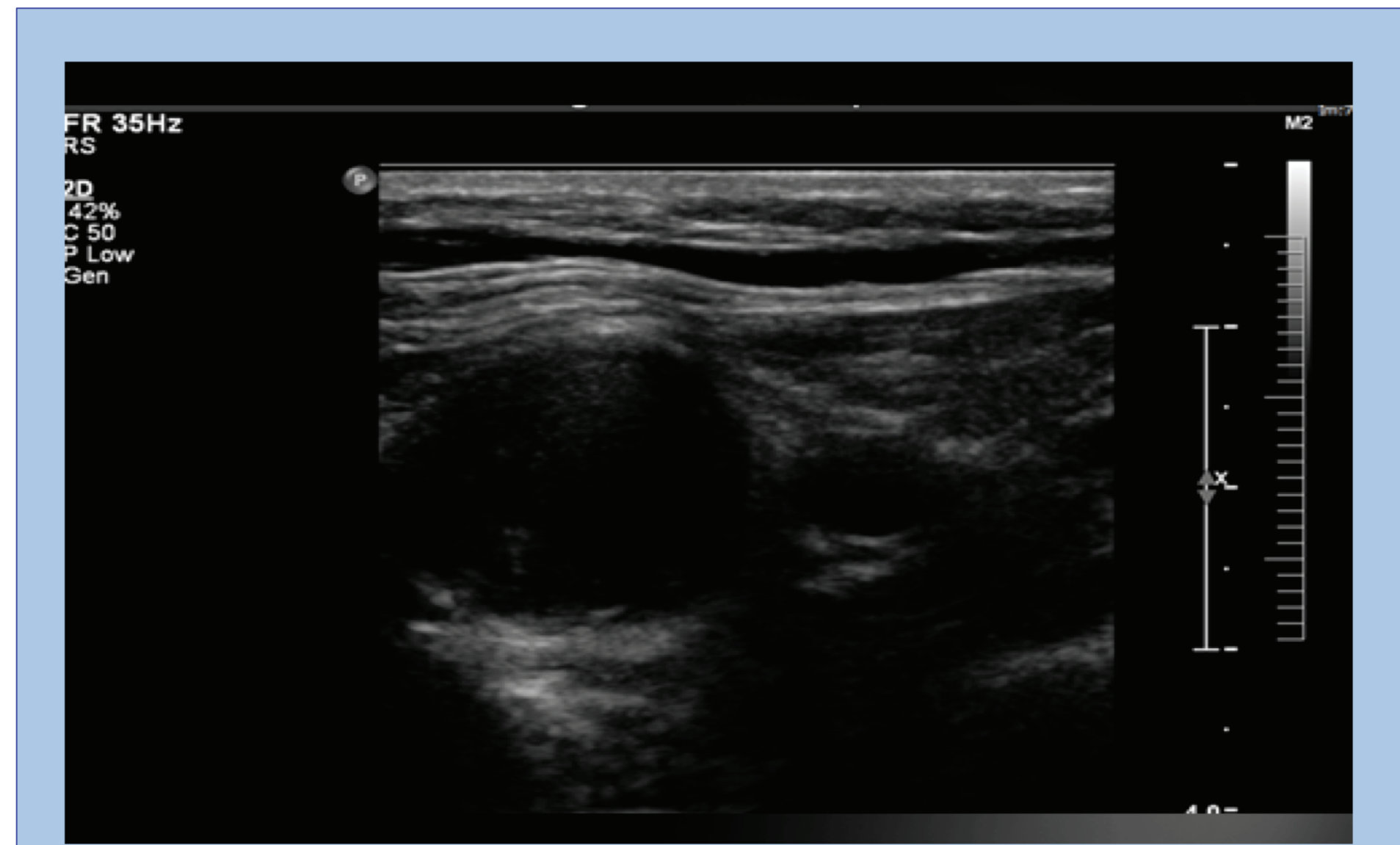


Image 1: Grayscale of Internal Carotid Artery and External Carotid Artery

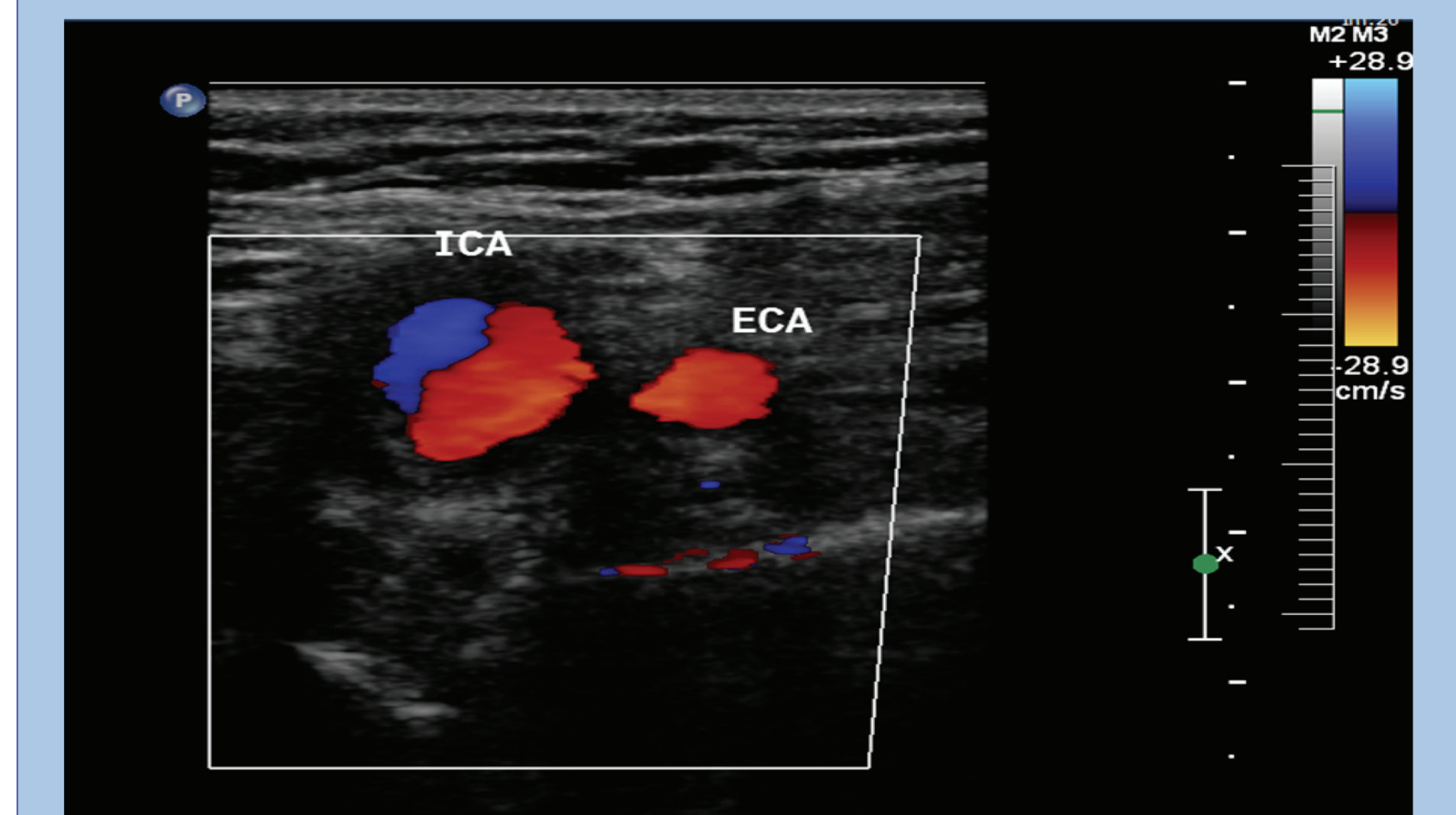


Image 2: Color image of Internal Carotid Artery and External Carotid Artery

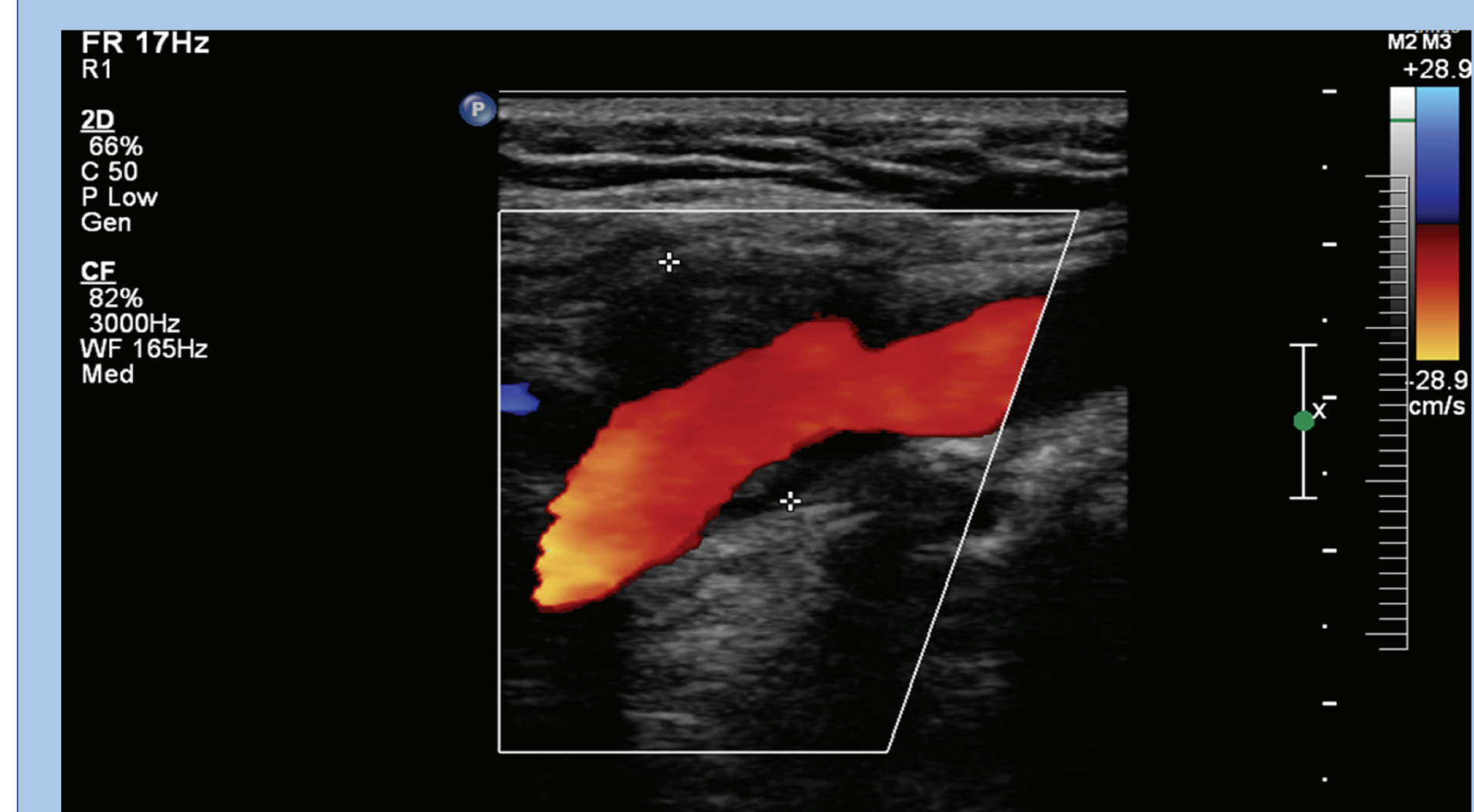


Image 3: Aneurysm in sagittal with color and measurement

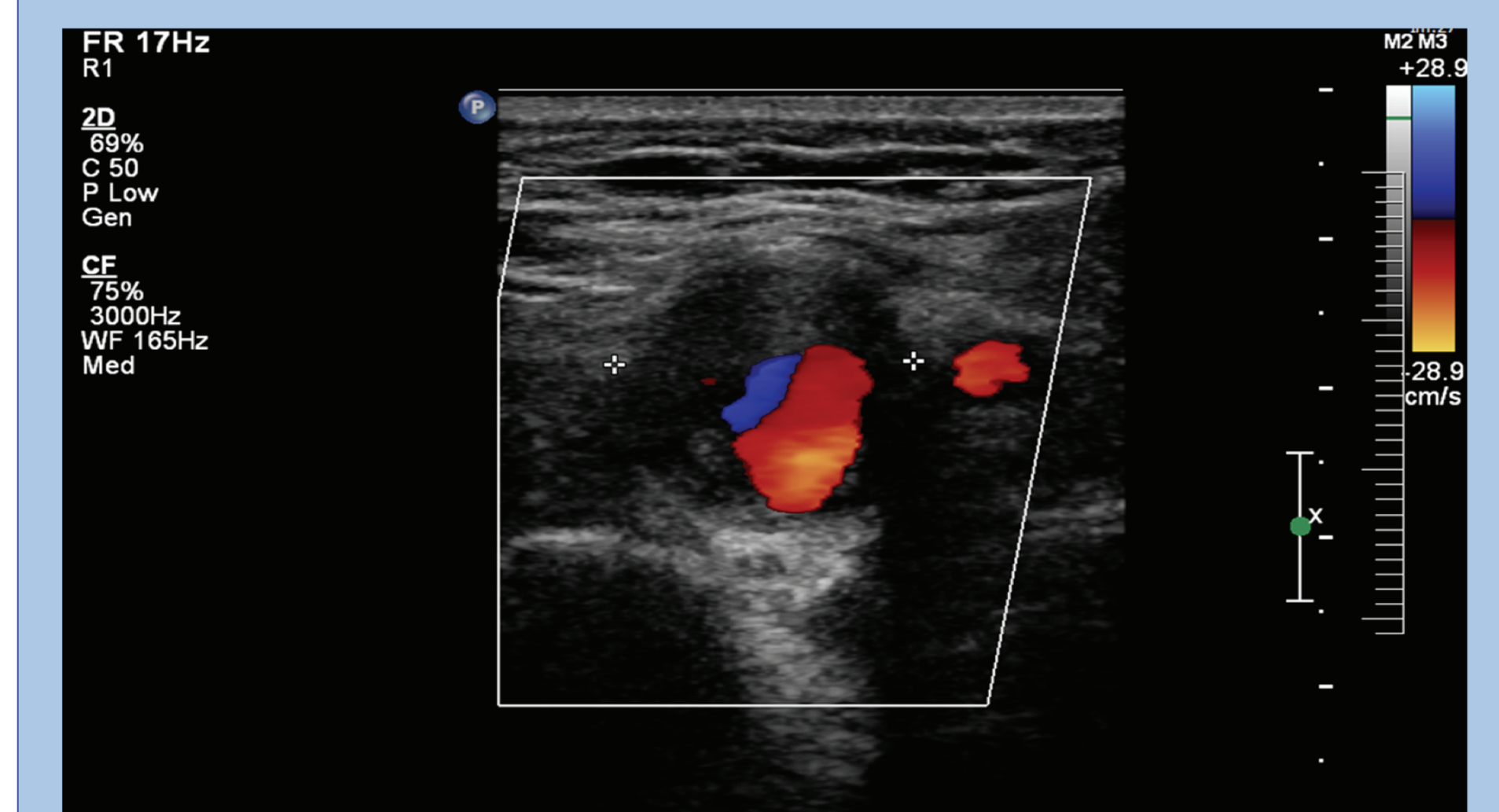


Image 4: Aneurysm in transverse with color and measurement

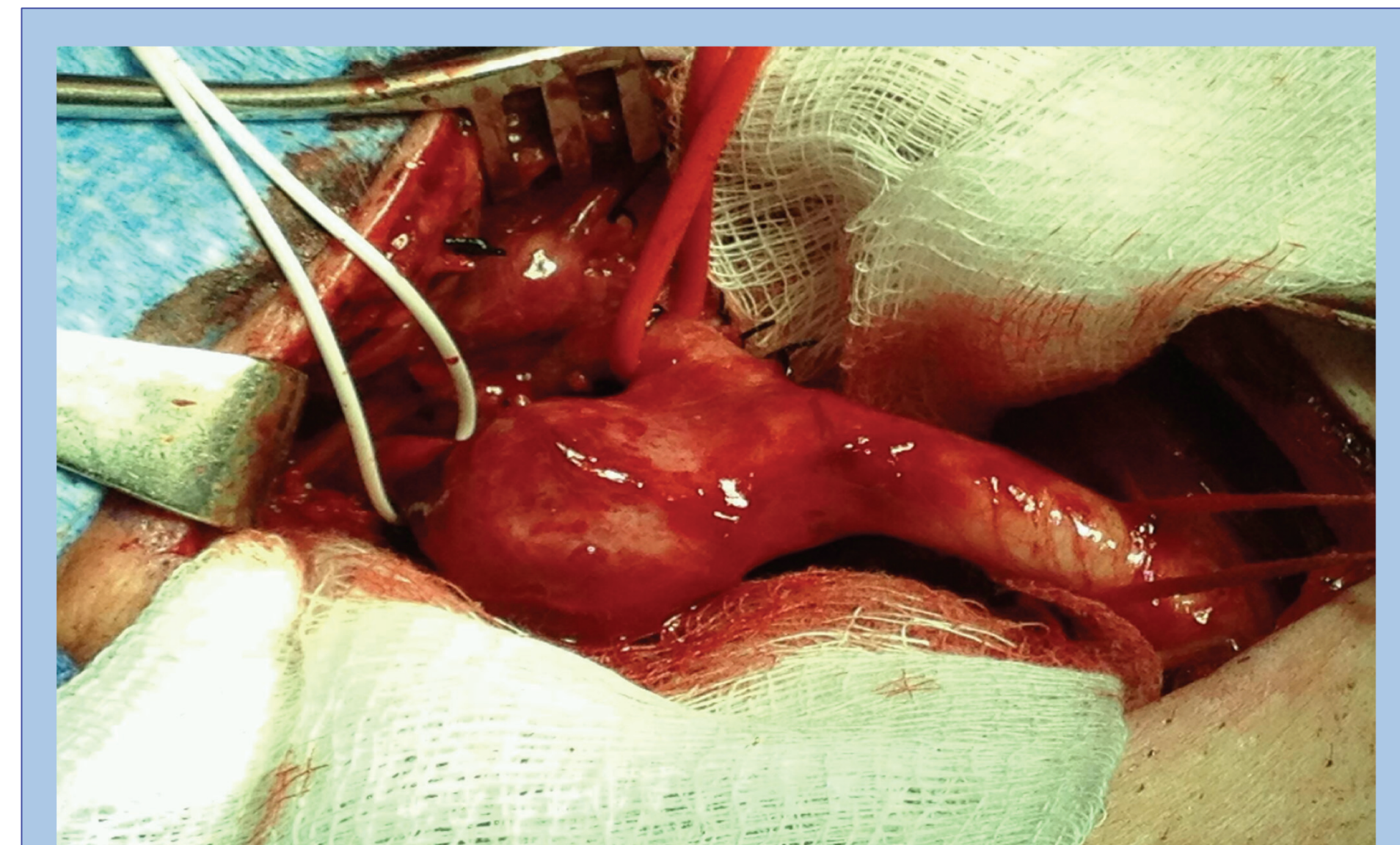


Image 5: Aneurysm before surgery

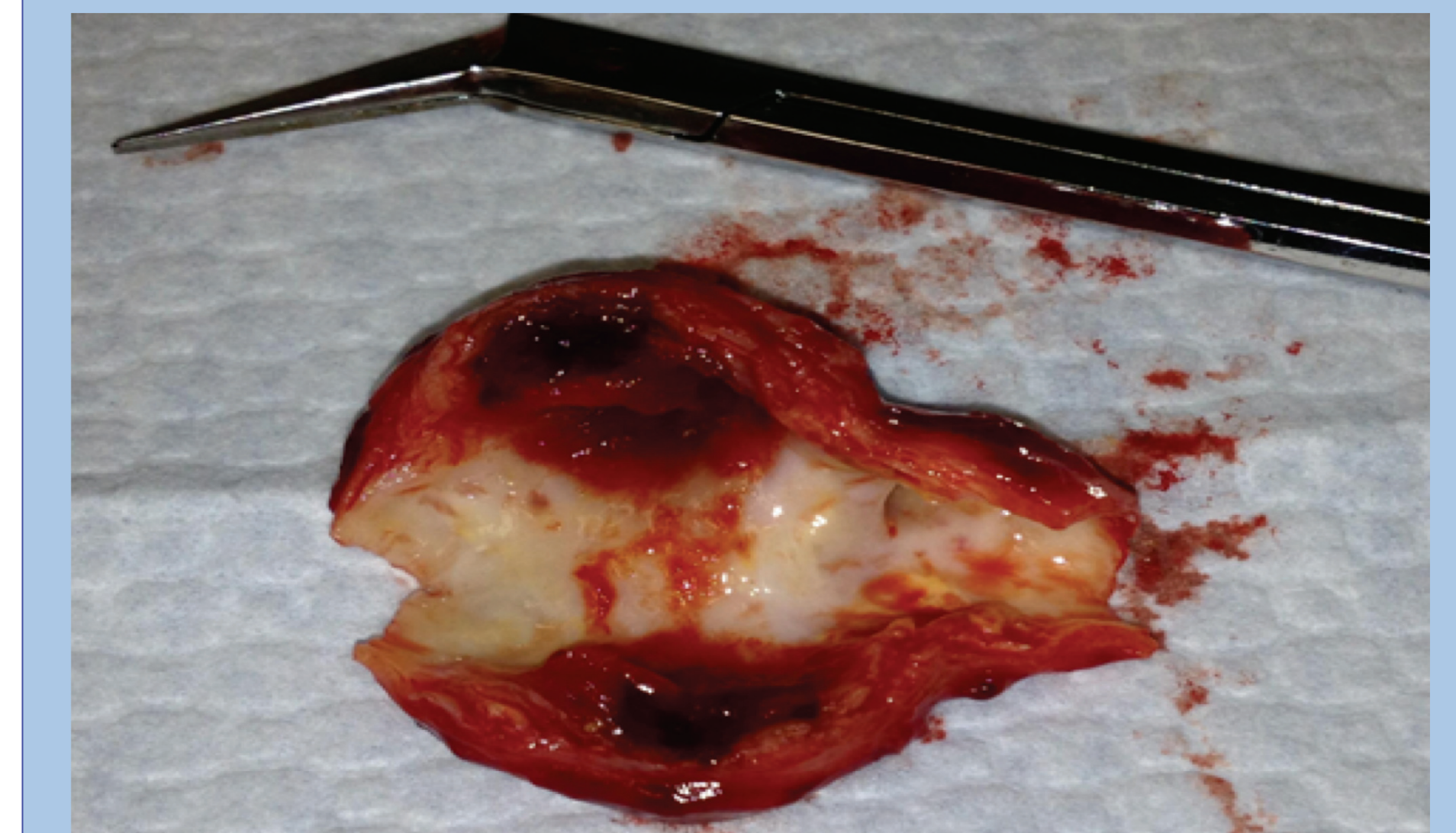


Image 6: Aneurysm after surgery cut open. Thrombus is seen within.

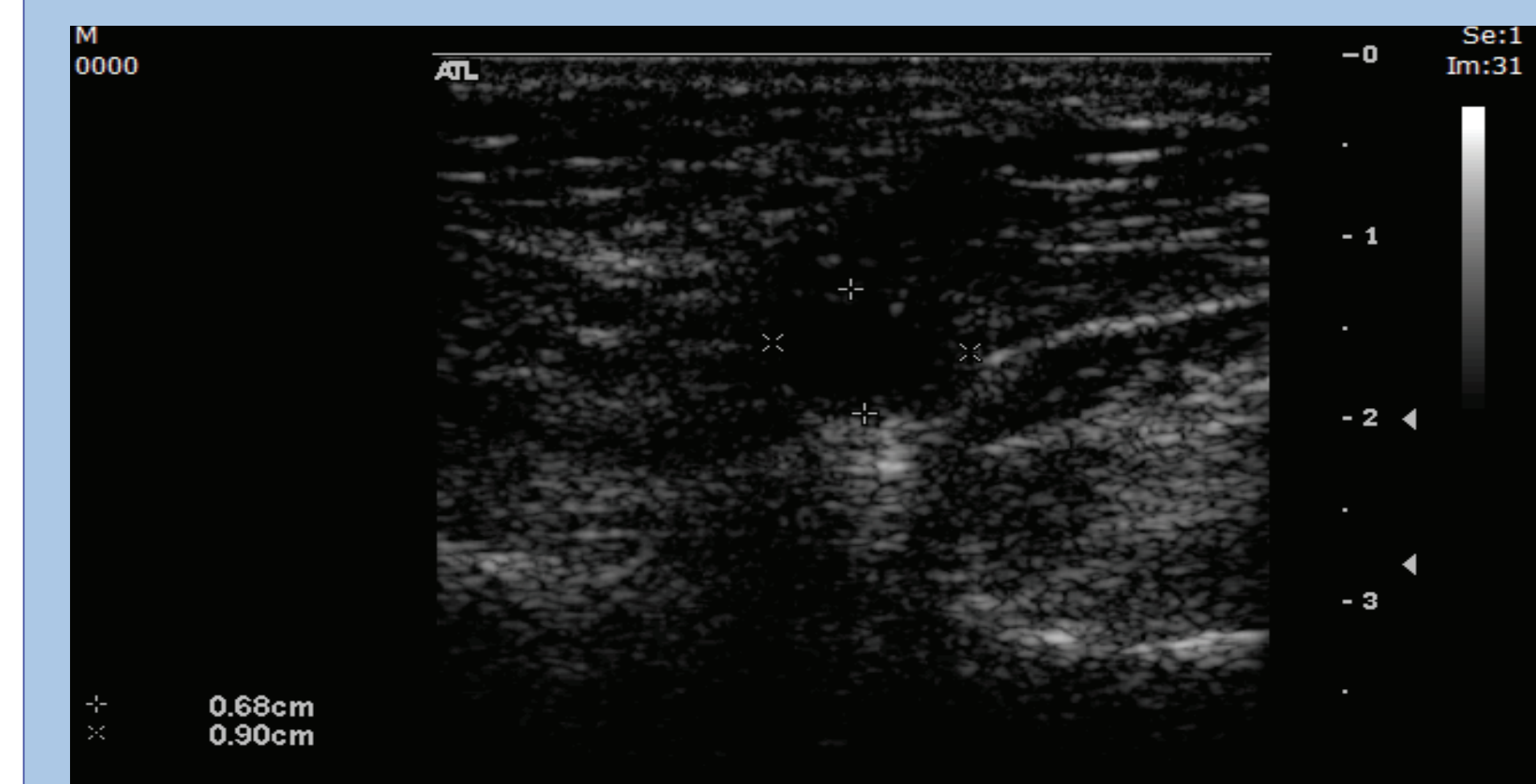


Image 7: Proximal ICA in transverse post surgery

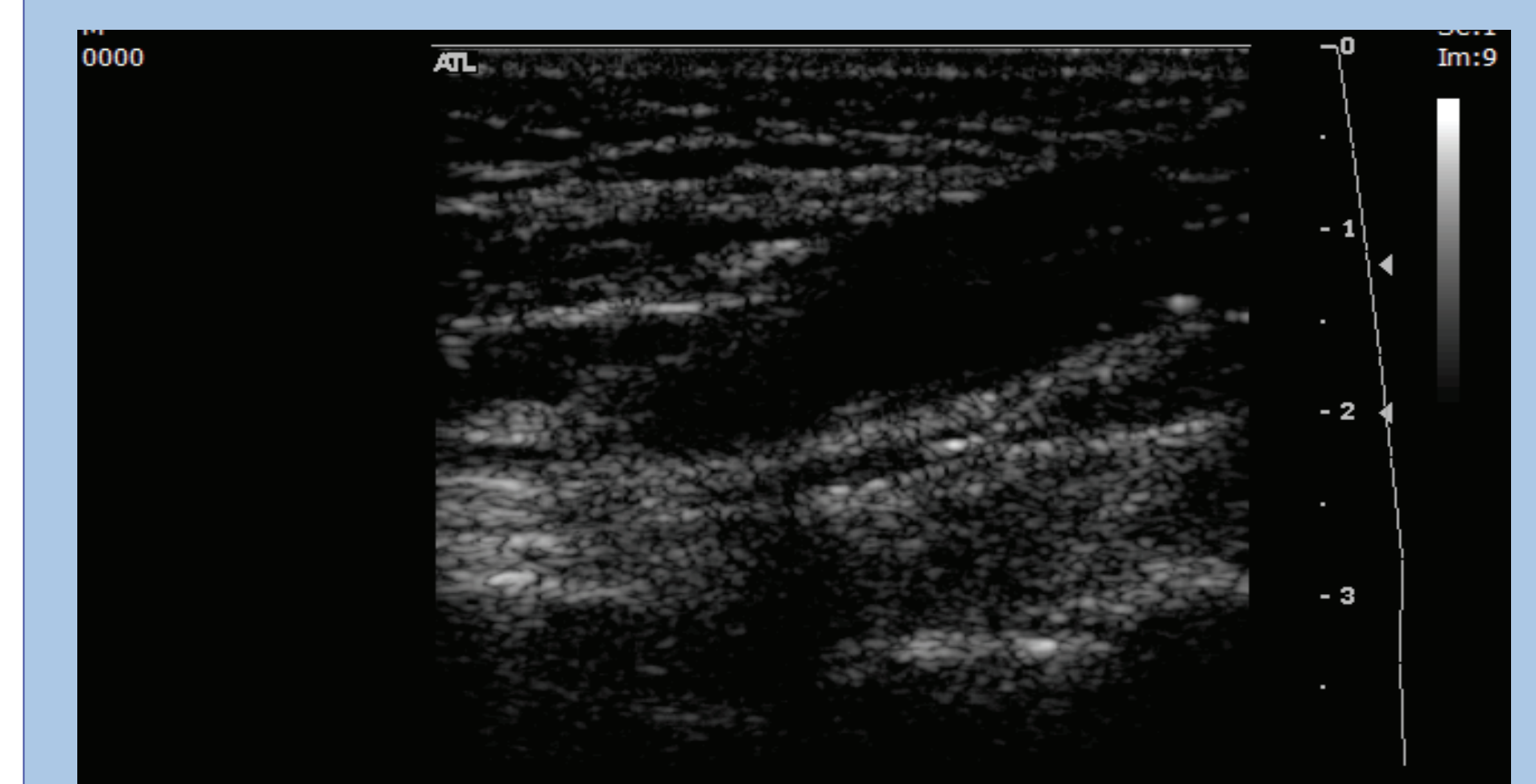


Image 8: Proximal ICA in sagittal post surgery

Discussion

Carotid aneurysms account for 0.4% to 4.0% of all aneurysms. Repair of this lesion comprises only 0.9% of all carotid procedures. The most common location for carotid aneurysms is at the bulb and proximal ICA.

Possible complications include aneurysm rupture and cerebral embolism (embolization was seen in this case).

Atherosclerosis is the leading cause of carotid aneurysms comprising 46-70% of cases. Other causes include trauma, infection, and connective tissue disorders such as Marfan's Syndrome, and fibromuscular dysplasia. Risk factors include family history and smoking, both present in this case.

Although different types of imaging modalities can be used to diagnose aneurysms, in this case duplex ultrasound was sufficient to measure the size of aneurysm and identify mural thrombus as the source of emboli. Proper imaging technique is necessary for pre-operative planning since surgery is the treatment of choice.

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