Right Atrium Thrombosis in Patients on Hemodialysis
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Vascular access has been the Achilles heel of hemodialysis for many years, and placement of temporary subclavian and internal jugular vein catheters has been a daily practice for the nephrologist. Now, concern about central vein stenosis, well described with the use of subclavian catheters in end-stage renal disease (ESRD), has prompted the use of internal jugular vein permanent catheters to avoid this complication, so as not to hinder future arteriovenous grafts. Permanent catheter access is not without its own special problems, and we describe here two patients that developed thrombosis of the right atrium while receiving hemodialysis through a permanent internal jugular catheter.

INDEX WORDS: Thrombosis; right atrium; hemodialysis; dialysis catheters.

CASE REPORTS

Case No. 1
A 47-year-old white woman who had end-stage renal disease secondary to hypertension was started on hemodialysis in June 1994 through a 20-cm (Vascath, Affiliated Medical Research Inc, Martinsville, IN) right subclavian catheter. On reviewing the films, the catheter tip was in the right atrium. In July of the same year, because of problems with clotting of a Gortex graft placed in her left arm and inability to perform peritoneal dialysis, a 40-cm silicone permacath (Bard Vascular Systems, Salt Lake City, UT) was inserted in the right internal jugular vein. Again, in reviewing the films, the tip of the permanent catheter laid in the right atrium (Fig 1A). Because of recurrent thrombotic problems with her arm graft, she continued to receive dialysis through the permanent catheter. In September 1994, during a routine checkup, an echocardiogram showed a mass on the right atrium. Then, a gadolinium magnetic resonance imaging scan of her heart raised the question of a right atrial myxoma. Eventually, the patient underwent open heart surgery to remove the atrial mass, which was found to be a thrombus attached to the wall of the right atrium. Interestingly, the permanent catheter was not attached to the thrombus. Both thrombus and permanent catheter were removed, and the patient was dialyzed through a femoral permanent catheter until a successful right arm graft was placed. She now continues to receive hemodialysis through her graft and has been placed in chronic oral anticoagulation because of her high clotting tendency.

Case No. 2
A 43-year-old white woman diagnosed with fibrillary glomerulonephritis was started on hemodialysis in September 1994 through a 40-cm right internal jugular vein silicone permacath (BARD). Radiographs showed that her catheter tip laid on the right atrium (Fig 1B). The patient was dialyzed through that catheter for several weeks with the plan of starting her on continuous ambulatory peritoneal dialysis (CAPD). However, when the peritoneal catheter was inserted, it was found that she had a large ovarian cyst. Eventually, she underwent laparotomy for removal of the cyst, and she had a rocky postoperative course with infection of the abdominal wall requiring debridement. Through all this she continue to re-
received hemodialysis through the permanent catheter, with no blood flow problems. In December of the same year, while we were waiting for her abdominal problems to resolve to place her on CAPD, she developed a large pericardial effusion that required a pericardial window. On the day of admission with the pericardial effusion, an echocardiogram showed a significant effusion with collapse of the left ventricle without any mass in the right atrium. The patient had a pericardial window performed without major complications, and she left the hospital 10 days later. A week later she came back for a follow-up echocardiogram, which showed a mass on the right atrium (Fig 2). A transesophageal (TEE) echocardiogram showed the permanent catheter to be attached to the thrombus. At that time, it was decided to place her on long-term anticoagulation and continue to use her permanent catheter. The patient is still anticoagulated, and she will have regular follow-up echocardiograms.

DISCUSSION

The use of long-term internal jugular catheter for hemodialysis is a relatively new technique, and it has been advocated for the treatment of chronic renal failure. The internal jugular vein is preferred to prevent central vein thrombosis and stenosis, which has been clearly associated with the presence of catheters in the subclavian veins in hemodialysis patients. Uldal has used a new compressible soft Silastic catheter (Cook Critical Care, Bloomington, IN) with a 2% incidence of internal jugular vein thrombosis.

Grote et al reported a 30% incidence of thrombosis of the superior vena cava with the
long-term use of silicone rubber internal jugular catheters (Kimal Scientific Product, Ltd, Uxbridge, United Kingdom) for hemodialysis and suggested that TEE should be performed at regular intervals. In our practice, we have two cases of thrombosis of the right atrium associated with the use of internal jugular vein permanent catheter (BARD). In both of our patients, the tip of the catheter was in the right atrium, and this may have been a factor in the development of the thrombus. However, in reviewing the radiographs of our patients that have had either regular subclavian catheters or internal jugular permanent catheters, we have found that most of the catheter tips were in the right atrium. We want to emphasize that we have never seen thrombosis of the right atrium with regular subclavian catheters, perhaps because of the shorter length of time that they are left in place or maybe because of the size difference and composition of the these catheters.

In summary, we want to bring to the attention of the nephrologist the possibility of thrombosis of the right atrium in association with the long-term use of internal jugular catheter and to suggest avoiding positioning the catheter tips deep in the right atrium.

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REFERENCES

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