Branch Retinal Artery Occlusion From a Retained Left Atrial Catheter 21 Years After Operation

Jonathan J. Drummond-Webb, Paula M. Bokesch, Makram R. Ebeid, Daniel J. Murphy, George E. Sarris and Roger B. B. Mee

Ann Thorac Surg 1998;65:254

Comment

Multiple primary tumors have been identified in two groups: (1) those presenting in distant or unrelated tissue and (2) those with local recurrence in a "multicentric zone" [2]. Treatment of the initial head and neck cancer has not altered the recurrence of the local lesion or the appearance of a lesion at a new site [3]. The contribution of radiation treatment for one cancer to the occurrence of malignancy in the radiation field is unknown.

The p53 protein is the most common gene mutated in human cancers [4]. More than half of all neoplasms in humans are thought to have mutation of the p53 protein [5]. The protein coded by the p53 gene functions in cell cycle regulation and is involved with cell apoptosis [6]. Normal p53 (wild type) is a tumor suppresser gene. The p53 protein is a transcription factor that can modulate the expression of genes (up-regulation and down-regulation) at transcription level. There are three proposed mechanisms for p53 tumor suppressive function. It is known to act at G1-S transition of the cell cycle. If damaged DNA is detected, the cell replication is slowed to allow for repair of the damaged DNA. The p53 protein also increases the DNA repair by the proliferating cell nuclear antigen. The last proposed mechanism is the induction of apoptosis when damaged DNA is encountered by the p53 protein. It is not clear what prompts the p53 to employ one of the above-mentioned tumor suppressive mechanisms.

The significance of the data presented above is not clear. Results of immunohistochemical tests for the presence of the mutated p53 gene may also be positive in normal tissue and cancer cells that have not reacted to mutated p53 monoclonal antibodies. Thus, application of analysis of p53 in the clinical situation remains controversial and investigational at present.

The surgical goal in this patient was diagnosis and simultaneous resection of both pulmonary and esophageal masses. The radical operation was completed in two stages to reduce the potential of bronchoesophageal fistula formation because simultaneous gastroesophageal reconstruction would have localized the esophageal anastomosis quite close to the resected right upper lobe bronchus.

Because we used two stages, the interval before resection could have served for radiochemotherapy and further decreased the risk of fistula. Fortunately, the mediastinal nodes resected were negative for metastasis. Substernal gastric transfer was elected because resection of the right upper lobe precluded one-lung anesthesia to permit colon transposition through the left side of the chest. Our approach was successful and the patient did well.

In conclusion, multiple primary malignant neoplasms of the aerodigestive tract present an interesting problem in terms of common etiology. Genetic examination of these tumors, still controversial, may lead to information improving our knowledge of their causation.

Our patient had four such multiple primary neoplasms. Tonsillar carcinoma was treated with radiation. Synchronous different cell carcinomas of the lung (adenocarcinoma) and esophagus (squamous cell carcinoma) followed 4 years later. Squamous cell left lingual carcinoma developed 6 years after the initial radiation for tonsillar cancer. This last cancer may be a primary tumor, a local recurrence of the tonsillar carcinoma, or a result of the radiation therapy.

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A case of branch retinal artery occlusion due to an embolus from a retained left atrial catheter is presented. Removal was accomplished by reoperation. Prompt removal of any retained intracardiac catheter is recommended.

(Ann Thorac Surg 1998;65:254–5)

A previously healthy 25-year-old woman had undergone closure of a ventricular septal defect at the age of 4 years in another institution. She presented to the emergency room with sudden, complete, painless loss of vision in her left eye. She reported no other symptoms aside from an isolated episode of syncope 5 months prior. Angiographic and opthalmologic studies documented a left-sided branch retinal artery occlusion. A Holter monitor failed to document any atrial fibrillation. A transthoracic and subsequent transesophageal echocardiogram

Accepted for publication Sep 4, 1997.

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0003-4975/98/$19.00
PII S0003-4975(97)01198-3

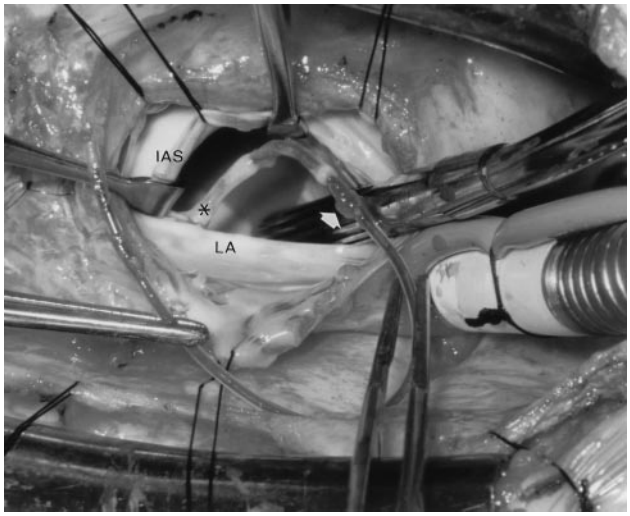

*Fig 1. Intraoperative photograph of left atrium through a transeptal approach. The retained catheter is shown with fresh thrombus on its surface (*arrow*). The tip (*) is attached to the mitral annulus posteriorly. (*IAS = *interatrial septum;* LA = *left atrium.)*

showed a small residual ventricular septal defect with left-to-right shunting. Surprisingly, a long, linear echo density consistent with a foreign body covered with thrombus was demonstrated in the left atrium.

Review of the medical records from the time of ventricular septal defect closure revealed that, with left atrial catheter removal on postoperative day 2, the catheter had broken and a segment had been left in the patient. No further action had been taken, and she recovered uneventfully and remained asymptomatic for 21 years.

It was thus thought that her branch retinal artery occlusion represented a cerebral embolic episode originating from the retained catheter. She was given intravenous heparin and urgent resternotomy was undertaken. At operation, manipulation was minimized and only enough of the cardiac structures and left atrium were exposed to allow safe aortic and bicaval cannulation. Mild hypothermia and cold blood cardioplegic arrest were used. The tip of a plastic catheter was encountered firmly anchored in the interatrial groove. The left atrium was entered through a right atrial transeptal incision to avoid disturbing the thrombus. A polyethylene left atrial catheter, 10 cm long and coated with both organized and more recent thrombus, was found. The catheter was tethered to the mitral valve and anchored to the base of the right superior pulmonary vein, making a loop within the left atrium (Fig 1). The catheter was extracted, and the left heart was carefully examined and lavaged to remove any residual thrombus. The residual ventricular septal defect was approached through the tricuspid valve, and the small defect was closed with a few interrupted Teflon-pledgeted sutures. After closure of the atrial incisions, weaning and separation from bypass were unremarkable. Transesophageal echocardiography confirmed complete removal of the left atrial catheter and the absence of any residual ventricular septal defect.

The patient recovered uneventfully and was discharged home on the third day postoperatively. Her visual field defect remains unchanged 1 year after the operation.

Comment

Indwelling intracardiac monitoring lines are frequently used in congenital cardiac operations. Surprisingly there is little information regarding complications related to retained left-sided catheters. However, right-sided indwelling catheters are not without risk, especially in infants [1, 2]. Possible, but infrequent complications include dislodgement or bleeding at the time of removal. On rare occasions (0.2% over a 4-year period at our institution), a catheter can break at the time of removal, probably due to technical factors, resulting in a fragment being retained in the patient. Our policy is immediate removal of any retained catheter fragment, by mediastinal reexploration if necessary, to prevent late complications. Percutaneous, basket catheter removal of retained intravascular foreign bodies has successfully been described [3]. However, the presence of thrombus and the recent branch retinal artery occlusion precluded this approach in our patient. This case of late embolism from a retained left atrial catheter reinforces this policy of immediate removal.

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Extended Aortic Arch Atherectomy

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We report 2 cases of extensive atherosclerosis of the ascending aorta, arch of the aorta, innominate artery, and bilateral carotid arteries treated surgically at St. Vincent and Veterans Administration Medical Centers of Portland, Oregon.

(Ann Thorac Surg 1998;65:255–7)

Accepted for publication Sep 5, 1997.

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0003-4975/98/$19.00
PII S0003-4975(97)01285-X

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