gastric juice. As illustrated by this case and others, insufflation of air with auscultation for bubbling is an inadequate test for proper position of the tube; sounds may be transmitted from the esophagus, lung, or either pleural space.

Fifth, in patients receiving mechanical ventilation, check for condensation of water vapor in the nasoenteric tube synchronous with ventilation. If this occurs, suspect misplacement of the feeding tube into the tracheobronchial tree. Additionally, if airway placement is suspected, submerge the proximal end of the nasoenteric tube under water and look for bubbling, which would also suggest errant placement. In the context of airway placement, the absence of those findings may result from occlusion of the distal lumen of the feeding tube.

Sixth, if the tube cannot be successfully passed after two attempts or if obstruction is apparent, endoscopic guidance of the tube into the stomach should be used. Seventh and finally, in patients who are debilitated and have altered mental status, confirm appropriate placement of nonendoscopically positioned feeding tubes with a chest roentgenogram prior to the instillation of any fluid.

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REFERENCES
13. Zwagil DW, Metzger KO. Mechanical ventilation compromised by misplacement of nasogastric tube: report of an unusual incident. Respir Care 1975; 19:60

Essential Thrombocythemia and Coronary Artery Disease*

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An unusual case of essential thrombocythemia in a young man presenting with progressive angina pectoris is presented. Angiography revealed proximal left anterior descending artery stenosis. Successful percutaneous transluminal angioplasty along with antiplatelet therapy and a calcium channel blocking drug have rendered this patient asymptomatic.

Symptoms of coronary artery disease in a young man usually suggest that atherosclerosis is the underlying etiology. However, unusual forms of coronary artery obstruction can be found in younger patients and should prompt the physician toward further investigation. Essential thrombocythemia (ET) is one of the unusual causes of angina pectoris and myocardial infarction. Two recent reports have dealt with young men with essential thrombocythemia sustaining myocardial infarction. We report a young man with angina pectoris and offer a successful therapeutic approach involving percutaneous transluminal angioplasty (PTCA), antiplatelet therapy, and administration of calcium antagonists.

CASE REPORT
A heavy smoking, but otherwise healthy 28-year-old man decided to begin running and to discontinue smoking in 1979. In early 1983, he began experiencing angina pectoris during his daily six-mile run. Only twice did he experience rest angina, following ingestion of a

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Figure 1. Before angioplasty. The stress and redistribution thallium-201 images reveal reversible perfusion of the anteroseptal wall of myocardium consistent with LAD obstruction.
Very cold drink. The frequency and severity of his angina increased and he was referred for cardiac evaluation in July, 1983. There was no history of hypertension, diabetes, family history of coronary artery disease, or lipid abnormalities. Upon admission to the hospital, the vital signs were normal. Positive physical findings included axillary lymphadenopathy and splenomegaly. The scalar electrocardiogram revealed anterior T-wave inversions. Findings on the chest roentgenogram were normal. Results of a complete blood count were normal, except for a platelet count of 1.3 million. The cholesterol was 165 mg per deciliter with 31 percent high density lipoprotein. The triglyceride level was 107 mg per deciliter. A two-dimensional echocardiogram was normal. Bone marrow examination revealed megakaryocytosis and a mildly hypopcellular marrow confirming the diagnosis of essential thrombocythemia. Lymph node biopsy revealed caseating granuloma, but results of all cultures were negative. A PPD test was negative. Exercise thallium scintigraphy was performed. The patient developed anterior ST elevation and chest pain in stage 3 of the Bruce protocol. The angina lasted briefly and he completed 13 minutes of exercise. Scintigraphy revealed a large anteroseptal defect that reperfused at rest (Fig 1).

Diltiazem 30 mg thrice daily, aspirin 325 mg daily and busulfan 4 mg daily were begun. Once the platelet count was lowered, cardiac catheterization was performed revealing a proximal 95 percent left anterior descending (LAD) artery stenosis (Fig 2). The overall ventricular function was normal, but there was mild anterior hypokinesis.

Because of continued angina pectoris, PTCA was successfully performed. Coronary angioplasty was performed with a 3.0 mm USCI Gruntzig catheter. The initial gradient across the lesion was 60 mm Hg. Following successive dilatations up to 9 atmospheres, the gradient was totally abolished. The follow-up angiogram (Fig 3) revealed minimal narrowing at the site of the original lesion. Maintenance medications included aspirin and diltiazem. The patient was re-exercised with thallium scintigraphy (Fig 4) and completed 15 minutes of the Bruce protocol without angina or ST-segment shifts. The thallium images were essentially normal.

The patient has been followed-up for six months following PTCA and is asymptomatic. He runs daily and recently finished a 5-kilometer race in less than 20 minutes, his best finish ever.

**Discussion**

Angina pectoris in a young man is not always caused by fixed atheromatous coronary artery disease. In a review of other etiologies of myocardial ischemia Cheitlin et al include essential thrombocythemia. Essential thrombocythemia is a rare disorder with myocardial infarction previously reported three times. Two reports involved autopsies and revealed that the patients (aged 22 years) had no significant coronary atherosclerosis. We presume that this patient’s lesion was either a thrombus or thromboembolic material, although we cannot ignore the possibility of co-existing atherosclerosis.

The propensity to form thrombus in patients with essential thrombocythemia could account for the formation of the LAD stenosis. However, there were additional factors accounting for this patient’s anginal syndrome. The two anginal episodes following ingestion of a cold drink, and the exercise-induced ST-elevation point toward coronary artery spasm playing a significant role in inducing ischemia. Perhaps platelet release of thromboxane A2 added to the tendency towards coronary artery spasm.

In the case report of Pick et al coronary angioplasty was not performed because of the length of the LAD lesion and a "proclivity towards excess bleeding and thrombosis." We feel that angioplasty can be performed without excessive risk. However, the other pathologic processes were also recognized and treated at the same time. The platelet count was lowered with busulfan. The tendency towards platelet aggregation was negated by aspirin. Coronary artery spasm was
treated with a calcium channel blocker, in this case diltiazem. Therefore, with knowledge of the various disease processes and directing our therapy toward each component, this particular patient is now asymptomatic and able to subsequently pursue a vigorous lifestyle.

In summary, we present a case of essential thrombocytosis with crescendo angina pectoris in a young man. PTCA in combination with antiplatelet and calcium channel-blocking drugs have been successful in returning this patient to a very active life. We feel that angioplasty can play an important role in treatment of coronary artery lesions in this disease.

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REFERENCES

Fiberoptic Bronchoscopy for Intraoperative Localization of Endobronchial Lesions and Foreign Bodies*

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The use of the fiberoptic bronchoscope for pinpointing a lesion during the course of surgical endobronchial extraction is described. Two cases are outlined: removal of a retained foreign body; and excision of a pedunculated bronchial tumor. The use of a bronchoscope as an aid during thoracotomy for bronchial lesions is emphasized.

Many techniques have been devised to remove foreign bodies from the endobronchial tree. In as early as 1897, Gustav Killian described removal of a foreign body by way of a rigid bronchoscope. Before that time, direct trans-thoracic removal was the usual method, but only with considerable mortality. During this century, rigid bronchoscopy and, later, flexible fiberoptic bronchoscopy have been widely used for foreign-body removal, with a mortality of less than 1 percent. Tools such as the Dormier basket, claw, forceps, and the Fogarty balloon catheter have aided extirpation of many objects which have found their way into the tracheobronchial tree. In 1928, Jackson stated that 98 percent of foreign bodies could be removed by bronchoscopy (rigid); recent studies likewise indicate that nearly all foreign bodies can be removed endoscopically.‡ The use of the open-tube (rigid) bronchoscope remains the method of choice for

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Figure 1. Chest x-ray film showing metallic portion of corsage pin (arrow) (case 1).

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Figure 2. Pulmonary flow-volume loops demonstrating dramatic improvement between preoperative and postoperative evaluations (case 2).