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only light perception was present in the right eye. Funduscopi
copic examination showed a pale gray disk with whitish, 
refractile, unmovable plaques causing branch occlusion of the 
inferior and superior temporal retinal arteries (Fig 1). There 
were no carotid arterial bruits. At the cardiac apex, a pal
pable thrill was present, and auscultation revealed a grade- 
5/6 holosystolic murmur radiating to the axilla. A chest x-ray 
film showed cardiomegaly with calcification of the mitral 
anulus. The electrocardiogram demonstrated sinus rhythm, 
ventricular extrasystoles, and left ventricular hypertrophy 
with secondary ST-T wave abnormalities. Results of routine 
laboratory studies, the aortic arch, and carotid angiograms 
were all normal. Cardiac catheterization and angiographic 
studies revealed severe mitral regurgitation and an enlarged 
left ventricle.

On Sept 18, 1974, the patient underwent valvular replace-
ment. At operation the entire posterior leaflet of the mitral 
valve was heavily calcified, with calcification extending into 
the atrial wall for a distance of 3 to 4 cm. The calcium was 
extremely friable. Several chordae of the anterior leaflet were 
unattached. The valve was excised, and the calcium in the 
left atrium was dissected from the wall utilizing an endar-
terectomy spatula. Following this, a Starr-Edwards mitral 
prosthesis (model 6400) was inserted. The postoperative 
course was uneventful, and the patient was discharged on the 
12th postoperative day. When examined on Jan 8, 1975, his 
visual defects were unchanged. The patient reported no 
subsequent embolic phenomena. Pathologic examination of 
the mitral valve revealed thickened and calcified valvular 
leaflets. The chordae tendineae were thickened and fused.

DISCUSSION

Hollenhorst reported three patients with retinal 
embolizations that he thought were calcific. He listed the 
following distinguishing characteristics of calcific retinal 
embolization: (1) stark white appearance; (2) no holo-
graphic reflections; (3) nonmobile plaques; (4) retinal 
infarction is commonly visible; and (5) the presence of 
calcific lesions of the cardiac valves on x-ray films. Ot-
others have noted similar clinical findings with pathologic 
demonstration of calcific retinal embolization.4,5 Although 
the embolic material in our patient fortunately was not pathologically identified, the clinical presenta-
tion and findings on funduscopie examination were quite 
characteristic of calcific embolus.

Most authors reporting emboli associated with mitral 
valvular disease describe thrombotic episodes associated 
with mitral stenosis that may or may not be accompanied 
by mitral regurgitation.5,6 Calcific embolization is not 
uncommonly seen in calcific aortic valvular disease, but 
such embolization is an unusual complication of mitral 
valvular disease. The extensive calcification of the mit-
ral annulus with extension of the calcium to the left 
atrium, as seen in our patient, has been described patho-
logically.6 It is easy to see how this friable material was 
the source of emboli.

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Viral Inclusion Bodies in 
Tracheobronchial Epithelium of 
Asymptomatic Subjects*

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During a survey conducted for the cytodiagnosis of early 
bronchogenic carcinoma, cytoplasmic viral inclusion bod-
ies were found sporadically in tracheobronchial smears 
of asymptomatic patients of both sexes (ages ranging from 
18 to 80 years) undergoing general endotracheal anes-
thesia for surgery. A review of 3,049 cases performed to 
assess the frequency of occurrence of this phenomenon 
showed a 1.1 percent incidence in all smears studied. 
There was no relationship between smoking habit, age, 
or sex and the presence of inclusion bodies; however, 
there was a marked seasonal incidence, with 60 percent 
of inclusion-bearing smears being found during the 
months of January through March.

Cytoplasmic inclusion bodies found in the epithelia of 
the urinary tract and tracheobronchial tree have been 
reported by several authors; but whereas a-

fectcd cells were found in the urinary tract of both symptomatic and asymptomatic patients, such cells have 
only been reported thus far in the respiratory tract of 
subjects with viral disease and bronchogenic carcinoma.6 We have been able to study the occurrence of this phenomenon because of the facility with which tracheobronchial secretions can be obtained during 
general endotracheal anesthesia.4 Correlations have been 
attempted between the presence of cytoplasmic inclusi-
ions and sex, age, smoking habit, and reason for surgery  

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of the patients concerned, as well as correlations with the time of year and other cytologic abnormalities.

**Patients and Methods**

Three thousand forty-nine tracheobronchial smear samples were obtained on a daily basis between April 1, 1973 and March 31, 1975. These were reviewed for the presence of cytoplasmic viral inclusion bodies (Fig. 1). The smears were obtained from consented patients undergoing general endotracheal anesthesia for elective surgery; 5 ml of physiologic saline solution was instilled down the tracheal tube immediately after intubation and was suctioned for return within 30 seconds with a transparent catheter. The catheter was cut where it was seen to contain mucus. Secretions were retrieved with an applicator stick, smeared on slides, spray-fixed at once, and stained (Papanicolaou and PAS methods). Information obtained from all patients during a preoperative visit included age, sex, and smoking habit. In addition, all medical records were screened before and after surgery to ascertain (1) the reason for surgery, (2) any associated unrelated pathologic findings, (3) the histopathologic findings from surgical specimens, (4) the results of other diagnostic tests, and (5) the date of surgery. Smears from patients who had suffered from known viral infections within 15 days preceding surgery and from those with prediagnosed cardiac and infective pulmonary diseases were not included in the study.

All patients were screened for the first seven postoperative days; and the development of temperature elevations above 38.4°C (101.1°F), positive physical signs in the chest, and roentgenologic changes were noted. The epidemiologic approach of Goldsmith and Berglund was used. Variables among patients were listed, including age, sex, smoking habit, preoperative respiratory status, preoperative and postoperative diagnoses, and other associated diseases contributing to the physical status of the patient. The contribution of each variable to the factor studied was assessed. Significance of statistical correlations was calculated by the chi-square method, using the Yates correction factor, at values of P < 0.05, because the series was small in comparison to the total group of patients screened.

**Results**

Of the 3,049 smears screened, 35 (1.1 percent) were found to contain ciliated epithelial cells with eosinophilic cytoplasmic inclusion bodies (Papanicolaou stain). All were PAS-positive. Of these, 11 (31 percent) came from patients with extrathoracic malignant disease, one (3 percent) came from a subject with asymptomatic bronchogenic carcinoma diagnosed by routine roentgenographic study, eight (23 percent) came from subjects with benign tumors (uterus, breast, and prostate), and 15 (43 percent) came from patients suffering from a wide variety of conditions (inguinal hernia, retinal detachment, cholecystitis, fractures of the extremities, complications of pregnancy, tonsillitis, and peptic ulcer). No correlation could be found between the presence of inclusion bodies in smears and the age, sex, or smoking habit of patients. Although the incidences of malignant and benign tumors among patients with inclusion bodies appeared to be high (34 percent and 23 percent, respectively), they were not found to be significant when compared with the incidences of these tumors in the entire population screened (26 percent and 20.4 percent, respectively). No relationship was found between the presence of viral inclusion bodies and other abnormalities noted in smears; however, when the frequency of occurrence of inclusion bodies was assessed in relation to the season of the year, 60 percent (20) of all these smears (Fig. 2) were found to have been collected during the months of January through March.

One patient, who smoked 30 cigarettes a day, developed a temperature above 38.4°C (101.1°F) for the first three postoperative days. There were two nonsmokers who developed a temperature above 38.4°C (101.1°F) together with positive signs in the chest and roentgenologic infiltrates. One of these had an asymptomatic bronchogenic carcinoma, and the other had metastatic carcinoma of the breast and chronic lymphocytic leukemia. All signs disappeared within three days after the institution of bronchial washing and therapy with intermittent positive-pressure breathing. All other patients had uneventful postoperative courses.

**Discussion**

Other investigators have found that the respiratory tract has the highest rate of viral isolation of all body
systems. Whitehead has suggested that inapparent infection with respiratory as well as other viruses acts as a reservoir for epidemic periods. Unlike other descriptions of patients with such inclusions, our subjects had no respiratory symptoms. Our findings are more in line with those of Ström, who found viral shedding in the urinary tract of apparently healthy individuals. The Tecumseh and other studies of respiratory infections have demonstrated an increased incidence of infection with coronavirus, respiratory syncytial virus, and rhinovirus during the winter months; and it is, therefore, probable that the majority of our patients had asymptomatic infections with these viruses.

The low postoperative respiratory complication rate noted in this series seems to indicate that the presence of viral inclusion bodies is not a precursor of respiratory disease (even under stress conditions).

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Sick Sinus Syndrome Requiring Permanent Pacemaker Implantation in a Patient with Mirror-Image Dextrocardia*

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A patient with the sick sinus syndrome accompanying mirror-image dextrocardia which was associated with double superior vena cavae and an absent inferior vena cava is presented. A permanent transvenous demand pacemaker was inserted because of repeated episodes of dizziness and a documented 3½-second period of asystole. Precise knowledge of the venous system and the location of the apex of the right ventricle was necessary prior to permanent pacemaker implantation.

A group of disorders affecting sinus-nodal function have recently been described which may be manifested by either a slow or fast heart rate and may or may not be associated with symptoms of dizziness and syncope. The term, sick sinus syndrome, has been used and includes inadequacy of the sinoatrial node manifested by both persistent sinus bradycardia and cessation of sinus rhythm with replacement by an atrial or junctional rhythm. This report presents an adult case of sick sinus syndrome with mirror-image dextrocardia and situs inversus, double superior vena cavae, single spleen, and absent inferior vena cava with azygos continuation. The technique of permanent pacemaker insertion in dextrocardia is described.

CASE REPORT

This 48-year-old woman first came to this hospital in 1965 with the chief complaint of dizziness. Findings from the physical examination and the x-ray of the chest and abdomen were consistent with a diagnosis of dextrocardia with situs inversus. The electrocardiogram showed a junctional rhythm with a rate of 34 beats per minute and QRS morphology typical of dextrocardia. The patient was treated with sublingual administration of isoproterenol with good results. The current admission in March 1974 was prompted by several episodes of dizziness and one episode of syncope.

Physical Examination on Admission

Physical examination on admission revealed blood pressure of 110/70 mm Hg in both arms. Carotid pulses were equal and of good quality. The point of maximal impulse was...