congenital regurgitation. It is of interest to note that the case of Smith, DuShane and Edwards\textsuperscript{19} with isolated absent pulmonary valve who died shortly after birth had cystic medial necrosis.

References

30 Wang, Y.: Unpublished observations.

Reprint requests: Dr. Wang, Variety Club Heart Hospital, Minneapolis 55455

Comparison of Spirometry Measurements Using McKesson Vitalor and Collins Spirometer*

Ching Shiang Wang, M.D.,** Dale G. Boyington,† and Richard A. Krumholz, M.D., F.C.C.P.

The McKesson vitalor and 13.5 liter Collins spirometer were compared in evaluating FVC, FEV\textsubscript{1}, FEV\textsubscript{2}, and MEFR in 24 volunteers and 48 patients. It was found that the McKesson instrument was apparently unsuitable for accurate measurements of MEFR and FEV\textsubscript{2}, while proving satisfactory for FVC, FEV\textsubscript{1}, and FEV\textsubscript{2} determinations.

The growing incidence of chronic obstructive lung disease has led to an increasing use of simple ventilatory tests. In the past decade several water-

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*From the Institute of Respiratory Diseases and the Cox Institute, Kettering Medical Center, Kettering, Ohio.
**Cardiopulmonary Fellow, Cox Heart Institute, Kettering Medical Center.
†Chief Pulmonary Technician, Pulmonary Function Laboratory, Charles F. Kettering Memorial Hospital.

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less types of bellows spirometers have been designed for use in the physician's office as well as in the pulmonary function laboratory. Among these spirometers, the McKesson apparatus has been used extensively because of its light weight, low cost, simplicity and rapidity of measurements. Previous evaluations have found the ventilatory functions measured by this simple instrument to correlate satisfactorily with those done using a Collins spirometer. In our laboratory we noted a discrepancy between the McKesson vitalor and the 13.5 liter Collins spirometer when measuring maximal expiratory flow rate (MEFR). For this reason the present study was undertaken.

**Technique**

An automatic McKesson vitalor and a 13.5 liter Collins spirometer were used to measure forced vital capacity (FVC), forced vital capacity at 1, 2, and 3 seconds (FEV1, FEV2, FEV3), and maximal expiratory flow rate (MEFR) in 24 normal working hospital personnel and 48 patients with chronic lung diseases. The hospital personnel were selected at random and consisted of 18 women and six men. The body surface area ranged from 1.48 to 2.11 sq m. The subjects were tested in the standing position by a technician trained to perform pulmonary function tests. The McKesson and Collins tracings were calculated according to standard methods for the Collins and as described by the manufacturer for the McKesson. All values were reported ATPS for uniformity since the McKesson and Collins evaluations were done on the same day, the order being randomized. The results were analyzed by computer, using the Student t test and correlation coefficient.

**Results**

The results are noted in Table 1. There was no significant difference between the two methods in FVC, FEV1 and FEV2. The MEFR and FEV3 were significantly different in both patients and controls.

**Discussion**

The low MEFR value obtained by the bellows apparatus when compared to the Collins spirometer probably resulted from the inadequate bore of the bellows inlet. The bellows inlet causes a high expiratory resistance which has been estimated at eight times that of the Collins 9-liter spirometer. All control group values were at the lower limits of predicted normal with the Collins spirometer due to the fact that the values were reported ATPS rather than BTPS. The FVC values obtained in both the control and patient population disclosed no difference regardless of which spirometer was used (Table 1). However, the mean MEFR as measured with the McKesson was 72.5 percent of that measured with the Collins spirometer and therefore these values would fall below those found in standard MEFR prediction formulae. The mean FEV3 was also significantly different when the two spirometers were compared. This FEV3 difference could be related to the smaller scale utilized by the McKesson apparatus giving less accuracy of measurement at the terminal portion of the curve.

These data then suggest that as previously documented the McKesson vitalor gives FVC values comparable to a more sophisticated spirometer (Collins 13.5 liter) and therefore has good clinical application and usefulness. On the other hand, the vitalor was never meant to supplant the larger spirometers in the pulmonary laboratory and this is evidenced by our statistics which document a significant difference in both the MEFR and FEV3 when measured in control and patient population with a McKesson vitalor and a Collins 13.5 liter spirometer.

**References**


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Reprint requests: Dr. Krumholz, Kettering Memorial Hospital, Kettering, Ohio

Primary Hydatid Disease of the Mediastinum

R. Lozano Mantecón, M.D.,* R. Lozano Blesa, M.D., F.C.C.P.,** F. Solsona, M.D.,† and F. Marin, M.D.†

A primary Echinococcus of the upper mediastinum revealed itself as a cervical mass in an 18-year-old asymptomatic patient. Chest x-ray films and a thyroid scan led to the diagnosis of benign mediastinal tumor or cyst. Through a cervical approach a cystectomy was performed. The pericystic membrane was left “in situ”. The result of this simple operation was excellent. This, according to our view of literature, is the 22nd case of this condition published.

INTRODUCTION

This is probably the least frequent of all primary localizations of hydatid cysts (HC). Statistics of surgically treated hydatid disease (HD) give percentages up to 2 percent for this condition and this percentage includes primary and secondary cysts. In the series of one of the authors, the present case is the only one among 1,434 patients, that is to say, 0.06 percent (Table 1). There is a definite difference between primary and secondary HD of the mediastinum. The secondary HD arises as an extension of costal, vertebral or pulmonary HD and thus is much more frequent and, from the practical point of view, just a complication of the primary disease. Conversely, primary HD of the mediastinum must be considered as a rare condition involving peculiar therapeutic problems.

CASE REPORT

An 18-year-old girl was seen at the outpatient department with a mass at the base of the anterior aspect of the neck. This mass had grown slowly during the last nine months, but had produced no symptoms. One year and a half previously she experienced an episode of malaise, asthenia and nonproductive cough which lasted a month and disappeared without any treatment.

The girl did not seem acutely or chronically ill. There was a slight cyanosis of the cheeks; the peripheral pulse was rhythmic and of normal frequency; blood pressure was 115 systolic, 55 diastolic.

There was a round mass 4 cm in diameter, protruding above the sternal manubrium slightly to the left of the midline. This mass did not move with the swallowing movements. It was of firm consistency, nontender, nonadherent to the skin but not movable in any direction; its surface was smooth and it was sharply delimited except for its inferior pole, which seemed to be covered by the sternum. There were no palpable lymph nodes. The rest of the physical examination disclosed no abnormalities. The results of routine blood and urinalyses were within normal limits.

A posteroanterior (PA) chest film disclosed a slight symmetrical widening of the upper mediastinum. Contrast films of the upper esophagus revealed no displacements (Fig 1).

Thus we faced the diagnostic problem of a tumor of the anterior cervical regions with no signs of malignancy and with an intrathoracic prolongation without major symptoms of compression. We thought of the following conditions: nodular goiter, upper mediastinal tumor, or HC.

Basal metabolic rate (BMR) was plus 23 percent, iodemia (iodides in blood), 15.8 gm/100 ml, cholesterol (cholesterol) 185 mg/100 ml. Thyroidal 131I uptake-curve was within limits of normal function. A thyroid scan revealed a normal-sized gland with homogeneous 131I uptake and the lower pole of its left lobe apparently amputated (Fig 2). As we suspected a displacement of the thyroid toward the right and slightly upward by the growing palpable mass, radioscan was performed (Fig 3) which

![Figure 1. Oblique view of upper mediastinum showing anterior round opacity which enlarges normal mediastinal opacity.](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21471/ on 06/21/2017)