beats.56 recording parasystolic intervals. That at times, the extrasystole precipitated by beat RI can be concealed, even after long (type C) X-RI intervals. Consequently, the extrasystole following beat R2 becomes manifest and is associated with a long coupling interval.

The widely variable coupling intervals observed in this recording could suggest a diagnosis of parasystole, although a classic form of parasystole can be ruled out, since the interectopic intervals are not mathematically related. A form of modulated parasystole could therefore be considered, where the delivery of the ectopic impulse is accelerated or delayed due to an electrotonic influence exerted by the sinus beats.56 On the basis of this hypothesis, it could be assumed that the short interectopic intervals, containing a single sinus beat (X-RI-X) correspond to a shortened parasystolic cycle; whereas the long intervals (X-RI-R2-X) result from a prolonged parasystolic cycle. However, in the present case, modulated parasystole appears to be unlikely, since it was not possible, despite many attempts, to draw a phase-response curve which was compatible with all of the interectopic intervals. A major difficulty in the construction of a phase-response curve is that both the early (type A) and the late (type C) RI beats are followed by bigeminal extrasystoles. This suggests that, if modulated parasystole is present, both the type A and the type C RI beats effect an acceleration of the next ectopic impulse. This is because, when, during interventricular bigeminy due to modulated parasystole, the ectopic complexes are in manifest bigeminal rhythm, beat RI always effects an acceleration of the ensuing parasystolic impulse.56 Thus, late sinus beats must fall in the negative section of a biphasic phase-response curve, unless the reversal point occurs approximately at the end of the ectopic cycle, which is extremely unlikely. If both the type A and the type C RI beats shorten the parasystolic cycle, then the type B RI beats, which are associated with X-RI intervals intermediate between those of groups A and C, must also result in shortening of the ectopic cycle. It is thus not possible to explain the prolongation of a postulated parasystolic cycle where beat RI occurs with an X-RI interval of group B. Even the attempted construction of a triphasic phase-response curve, including a "supernormal" period8,9 was not feasible. The relatively long asystolic period following carotid sinus pressure is a further argument against a parasystolic mechanism. Had the ectopic activity been generated by an independent parasystolic pacemaker, the ectopic rhythm would probably have been unaffected by the vagal stimulation, so that ectopic complexes would have manifested during the sinus pause.

This case can be viewed as an unusual example of concealed bigeminy; however, unlike typical concealed bigeminy, the inapparent extrasystolic impulses are here revealed by (a) a bigeminal and trigeminal distribution of the ectopic complexes and (b) a clear difference in the coupling intervals of extrasystoles in bigeminal and trigeminal distribution. The longer coupling interval associated with the extrasystoles in trigeminal rhythm is probably due to concealed ectopic-ventricular conduction of the preceding blocked impulse. In this respect, it is worth noting that concealed conduction of the inapparent impulses has been postulated by Kinoshita et al10 to explain some distribution patterns of extrasystolic complexes.

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A New Tube for Single Lung Ventilation*
Shreekant V. Karwande, M.D.*

A recently developed endotracheal tube with a movable bronchial blocker (Univent tube) was used for single lung ventilation. A total of 50 intubations were undertaken for a wide variety of thoracic procedures. Each case was analyzed with respect to ease or difficulty of intubation, tube dislodgment, efficacy of lung collapse, and adequacy of single lung ventilation. Successful, safe selective intubation was accomplished in all cases.

Selective, partial, or total collapse of the target lung offers many advantages during thoracic operations. It provides optimal exposure of the hilum and great vessels, avoids

*From the Department of Surgery, University of Utah and VA Medical Centers, Salt Lake City.
†Assistant Professor.
Reprint requests: Dr. Karwande, 50 North Medical Drive, Salt Lake City 84132

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cardiac compression, and prevents lung injury from excessive parenchymal manipulation. The use of a double-lumen tube during thoracic surgical operations was first advocated by Bjork and Carlens\(^1\) to prevent drowning of the down lung in the lateral decubitus position. Problems associated with the use of the Carlen tube\(^2\) led to the development of the Robertshaw double lumen tube.\(^3\) More recently, a polyvinylchloride (PVC)\(^4\) double-lumen endobronchial tube was developed for single lung ventilation.

We have been using a new device for one lung anesthesia—the endotracheal tube with a movable bronchial blocker (Univent tube) introduced by Inoue et al.\(^5\) in 1981. This tube allows selective ventilation but still offers many advantages of conventional endotracheal tubes.

The device consists of an endotracheal tube with a small channel through the anterior internal wall which contains a 2 mm diameter endobronchial blocker with a low pressure high volume balloon (Fig 1). It is fully retracted in the main body of the endotracheal tube at intubation. The blocker can be advanced into the right or left mainstem bronchus and extends up to 8 cm beyond the tip of the endotracheal tube. This may be done blindly or under fiberoptic control. Inflating the balloon provides an airtight seal. The blocker itself has a tubing structure which can be used as conduit for suctioning, pulmonary lavage or high frequency jet ventilation. The tube has a slightly larger external diameter for its internal diameter because of the space taken by the blocker.

The purpose of this review was to examine a series of 40 patients undergoing thoracic surgical procedures in which the endotracheal tube with movable bronchial blocker was used for single lung ventilation.

**Materials and Methods**

In the past nine months, intubation using the Univent tube was performed in 50 consecutive patients undergoing lateral thoracotomy. Patients ranged from 36 to 72 years, with a mean age of 55 years. The operations performed were as follows: wedge resection, 15; pneumonectomy, 6; lobectomy, 8; exploratory thoracotomy, 15; esophagogastrrectomy, 4; thoracic aneurysmectomy, 1; and decortication, 1.

Prior to intubation, both cuffs are tested for inflation or leaks and the blocker is pushed back and forth to ensure free movement. Following induction, the Univent tube is introduced into the trachea. All intubations in this group of patients were performed by residents under the supervision of staff anesthesiologists. As soon as the tube is beyond the vocal cords, it is turned so that the ridge housing the movable blocker is directed towards the side to be collapsed. The Univent tube is generally introduced to the 20 to 22 cm mark. This tube rotation technic was first described by Inoue et al.\(^3\)

Since it is customary for us to perform a bronchoscopy before thoracotomy, a fiberoptic scope is introduced through the Univent tube to identify the bronchial anatomy. It also confirms the position of the blocker in the bronchus and the Univent tube above the carina. The Univent tube is secured in place and blocker left in the desired position with its balloon deflated. The patient is then turned to the decubitus position. During surgery, a particular sequence is adopted for successful lung deflation. The patient is disconnected from the ventilator and the endotracheal tube is left open to air while the surgeon gently compresses the lungs to evacuate air. After the lungs are thus fully collapsed, the blocker balloon is inflated and ventilation resumed. During one-lung anesthesia, patient is monitored via a radial artery catheter and a pulse oximeter. All patients were maintained on 100 percent O\(_2\) during single lung ventilation.

**Results**

There were no operative deaths or complications attribut-
ble to the Univent tube. Successful intubation was accomplished in all cases. The 8.5 to 9.0 mm internal diameter tubes were easily placed. The average time required for intubation and endoscopic confirmation was ten minutes. The tube rotation method was successful in 45 patients, and the remaining five patients required blocker advancement under bronchoscopic guidance. There was no instance of tube dislodgement. Lung deflation time ranged from 15 minutes to 150 minutes. Excellent lung deflation was accomplished in all but one case. Hypoxemia and hypercarbia was noted only in one patient because the Univent tube was partially blocked by secretions. There were two instances of dislodgment of the endotracheal blocker after positioning. In both these cases, it was possible to reposition the blocker under bronchoscopic guidance during surgery with the patient in the lateral decubitus position.

**DISCUSSION**

The Univent tube is a significant advance in one-lung anesthesia and offers several advantages over other double-lumen tubes. The intubation technique is quick, easily taught, and mastered. Fiberoptic bronchoscopy can easily be done and some of the potentially life-threatening complications such as bronchial rupture, esophageal injury, and vascular injury seen with double lumen tubes. Intermittent reexpansion or suctioning of the lung during operation is easily accomplished without dislodgment of the blocker. Apart from the operating room, this tube has been used to prevent aspiration and suffocation in cases of massive hemoptysis.

**REFERENCES**


**Standard Limb Lead QRS Concordance during Wide QRS Tachycardia**

**A New Surface ECG Sign of Ventricular Tachycardia**

G. Veerender Reddy, M.D.,* and Rahmat U. Leghari, M.D.†

The differentiation of ventricular tachycardia from supraventricular conducted with aberration constitutes a perennial challenge. We report a new surface ECG clue, hitherto undescribed, the presence of which, during wide QRS tachycardia, indicates that the tachycardia in question is ventricular rather than supraventricular with aberrant conduction.

**CASE REPORT**

The ECG (Fig 1) was recorded from a 61-year-old man who presented to the emergency room with dizziness and palpitations. The ECG showed a regular wide QRS tachycardia at a rate of 130/minute. The tachycardia was diagnosed as ventricular because of the following manifestations on 12-lead ECG: (1) QRS width was about 0.14; each QRS was followed by a retrograde P wave (arrows pointing to the P waves in lead V1). (2) The mean frontal plane QRS axis was about −120° (northwest axis). (3) Biphasic configuration of QRS in V1. (4) QS complexes in lead V4 and lead 1. (5) Finally, another interesting finding, hitherto unrecognized and which is the subject of this communication, was the presence of completely negative QRS complexes in all three standard limb leads (1, 2 and 3). We think this concordant pattern of QRS in standard limb leads also points to ventricular tachycardia. Further discussion of this finding follows (see Discussion). The 12-lead ECG obtained after cardioversion showed sinus rhythm with a mean frontal plane QRS axis of about +30° and anteroseptal infarction of undetermined age. There was a Q wave of 0.04 s duration in lead 3. Because of recurrence of the arrhythmia with conventional drug therapy, the patient underwent electrophysiologic study, which confirmed the tachycardia to be ventricular. The patient was treated with amiodarone with successful control of the arrhythmia.

*Cardiology Section, VA Medical Center, Wilmington, DE.
†Cardiology Section, VA Medical Center, Fargo, ND.

Reprint requests: Dr. Reddy, VA Medical Center, Wilmington, DE 19805

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