Maxillary Sinusitis, a Complication of Nasotracheal Intubation

JAMES F. ARENS, M.D.,* FRANCIS E. LEJEUNE, JR., M.D.,† DONALD R. WEBRE, M.D.‡

Debate has arisen concerning the use of orotracheal versus nasotracheal tubes for intubation when assisted or controlled ventilation is used in the postoperative period.\(^1\) Complications and difficulties associated with prolonged nasotracheal intubation include kinking or blocking,\(^2\) difficulty in suctioning,\(^3\) pressure necrosis of external nares,\(^4\) nasal synchia, hearing loss secondary to abrasion of the Eustachian tube, and laryngeal band.\(^5\) No reference to maxillary sinusitis as a complication of prolonged nasotracheal intubation could be found in the literature. A retrospective analysis of 200 patients who had undergone nasotracheal intubation for coronary-artery bypass surgery\(^6\) was performed and four instances of maxillary sinusitis on the side in which the nasotracheal tube had been inserted were found.

**REPORT OF FOUR CASES**

**Case 1.** A 63-year-old Caucasian man underwent aortocoronary bypass surgery and aortic valvuloplasty. A #40 French Airlon nasotracheal tube was inserted through the right nostril and maintained in place for 36 hours. Postoperatively the patient developed a persistent cough, hoarseness, and purulent drainage from the right nostril, although no fever developed. Ten days postoperatively the otolaryngologist noted that the vocal cords were inflamed and swollen but had good function. Roentgenograms showed opacification of the right maxillary sinus. Culture of purulent material grew Neisseria and Micrococcus species. The patient was treated with gentamicin. Two weeks later the symptoms had diminished and roentgenograms showed resolving sinusitis.

**Case 2.** A 50-year-old Caucasian man had a triple aortocoronary bypass. A #40 French Airlon naso-

---

* Professor and Chairman, Department of Anesthesiology, University of Mississippi Medical Center, Jackson, Mississippi 39216.
† Head, Department of Otolaryngology, Ochsner Clinic, New Orleans, Louisiana.
‡ Chief Anesthesiologist, Portsmouth Naval Hospital, Kittery, Maine.

Accepted for publication October 31, 1973.

---

**DISCUSSION**

Factors which may contribute to the development of maxillary sinusitis include the use of nasotracheal tubes of large diameter. Choosing a tube of the proper diameter is a compromise between adequate size to decrease airway resistance and a size that isatraumatic. Application of topical vasoconstrictors to the nasal mucosa prior to intubation was not utilized. The nasotracheal tubes had been previously soaked in glutaraldehyde solution, well rinsed, and packaged individually under clean (but not sterile)
conditions. The material of the nasotracheal tube could be a factor in causing sinusitis. Although most patients were intubated with Airlon tubes, one patient who had a clear plastic tube developed sinusitis. The major etiologic factor seems to be mechanical obstruction. Duration of intubation does not seem to have been a factor in this small series, for many other patients were intubated for much longer periods. Prior to anesthesia identification of the larger nostril was attempted by observing movement of air through individual nostrils and by direct visualization. Frequently, these tests were invalid and the opposite nostril had to be utilized. Facial pain, nasal stuffiness, purulent secretions, or fever following nasotracheal intubation should alert the physician to the possibility of maxillary sinusitis secondary to poor drainage. Treatment consists of shrinking the nasal mucosa, appropriate antibiotics, and if necessary, surgical drainage.

REFERENCES

Circulation

ASSESSMENT OF SINUS-NODE FUNCTION “Sick-sinus syndrome” is the name given to a group of clinical conditions characterized by periods of sinus arrest and syncope and by sinus bradycardia with or without brady-tachyarrhythmias. This study was performed to define the mechanisms of sinoatrial-node dysfunction. Thirty-one patients with the syndrome, aged 31–85 years (mean 69), were studied by 10-hour continuous electrocardiogram recording (Holter monitor) following carotid sinus stimulation, a Valsalva maneuver, exercise, an intravenous infusion of isoproterenol (1–2 μg/min), overdrive pacing, and intravenous administration of atropine (0.025 mg/kg). Case summaries are presented to illustrate the four subgroups as defined by these maneuvers, i.e., “carotid sinus hypersensitivity,” “bradycardia-tachycardia syndrome,” “episodic sinus arrest,” and “persistent symptomatic sinus bradycardia.” All patients whose cases were summarized were asymptomatic after implantation of transvenous or ventricular-demand pacemakers. As a group, these patients responded normally to exercise or isoproterenol infusion, but their resting heart rates were relatively unresponsive to a large dose of atropine. In eight patients, carotid sinus massage produced sinus arrest lasting 3–6 seconds. Three of these patients required atrial pacing to restore cardiac rhythm. Atropine uniformly abolished this hypersensitivity. In nearly all cases overdrive pacing resulted in a postponing sinoatrial node suppression of about 3 seconds (normal = 1 second). This abnormal response also was reduced by atropine, and was felt to be the most characteristic response of patients with this syndrome. The authors conclude that their method of investigation is helpful in the diagnosis of sick-sinus syndrome in patients with histories of syncope. (Mandel, W.J., and others: Assessment of Sinus Node Function in Patients with the Sick Sinus Syndrome. Circulation 46: 761–769, 1972.)