Maxillary Sinusitis, a Complication of Nasotracheal Intubation

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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 synechiae, 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 surgery6 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 nasotracheal tube was inserted through the left nostril and maintained in place for 26 hours. The patient had a smooth postoperative course for eight days, then experienced pain over the maxillary area and developed a fever. Roentgenograms showed left maxillary sinusitis. The sinus was drained; cultures of the drainage grew Proteus and E. coli species. Treatment included erythromycin and kanamycin. Two months later roentgenograms showed clear sinuses.

Case 3. A 44-year-old Caucasian man underwent a single aortocoronary bypass. A #40 French Airlon nasotracheal tube was inserted through the left nostril and left in place for 24 hours. Ten days postoperatively the patient experienced facial pain, purulent nasal drainage from the left nostril, and a temperature increase. Roentgenograms showed an air-fluid level in the left maxillary sinus and clouding of the left ethmoid sinus. Synechia and deviated septum of the left nostril were also present. Cultures of the nasal drainage grew Proteus mirabilis. Treatment included oxacillin and streptomycin. Symptoms subsided over the next three days and examination six weeks later showed clear sinuses.

Case 4. A 49-year-old man had a double aortocoronary bypass. A #36 French Forclear nasotracheal tube was inserted through the left nostril and left in place for 26 hours. The patient had a long history of previous sinusitis, and six days following the operation pansinusitis recurred, confirmed by roentgenograms. Treatment consisted of sodium cephalothin. The culture showed no growth, and a week later the pansinusitis had cleared.

Each of the four patients had received nitrous oxide-morphine anesthesia.

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 is atraumatic. 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 sinusal 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,” “brady-cardia-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 postpacing 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 46:751-769, 1972.)