povolemic surgical patients do not experience cardiac arrest following succinylcholine administration and most burned patients are not brought to the operating room in a severely hypovolemic state.

A fifth contributing factor in succinylcholine arrest is metabolic acidosis. Because most burned patients are acidic, and because as much as 50 per cent of succinylcholine is converted to monocholine by alkaline hydrolysis, it follows that a lowering of the pH inhibits the degradation of succinylcholine. Although all these factors, no doubt, play some role in the cardiac arrest following succinylcholine administration, the fact that all these patients have had uneventful anesthesias previously, using similar techniques and agents cannot be overlooked. Hence, it seems that the explanation is more apt to lie in the patient’s status rather than in the anesthetic management per se, for it is well recognized that the metabolism of patients with severe burns is markedly altered.

REFERENCES

Laryngeal Obstruction Due To Cricoarytenoid Arthritis

LT. JERRY A. PHELPS, MC, USN *

Arthritis of the cricoarytenoid joint may result in varying degrees of laryngeal obstruction. Because this entity involves the airway, can complicate intubation,1 and present as a medical emergency,2,3 anesthesiologists should be aware of its existence. Although cricoarytenoid arthritis was reported as early as 1800 by Mackenzie4 (followed only by sporadic reports5,6,7,8) and in several recent articles9,10,11 it is mentioned briefly only once in the anesthesia literature.12

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The opinions expressed in this paper are those of the author and do not necessarily reflect the views of the Bureau of Medicine and Surgery, U. S. Navy, or the Naval Service at large.

The cricoarytenoid joint is a true diarthroidal articulation,1-13 consisting of two cartilages moving freely on each other, a joint capsule, and a joint cavity lined with a synovial membrane13,14 (fig. 1).

Arthritis of this joint is not rare. Grossman and his colleagues15 found evidence of arthritic changes in the cricoarytenoid joint in 18 of 55 patients with rheumatoid arthritis. In a series of 100 patients with generalized rheumatoid arthritis, Lofgren and Montgomery16 found 26 patients with involvement of this joint. Of these 26 patients, 23 gave a history of significant laryngeal symptoms.

Although rheumatoid arthritis is a common etiology, fixation of this joint has been associated with other forms of arthritis, i.e., gouty.
Reiter's disease, Tietze's syndrome, disseminated lupus erythematosus, trauma (fig. 2), infections of the larynx, and long standing paralysis of the recurrent laryngeal nerves.

CASE REPORT

A 61 year old white woman with severe, generalized rheumatoid arthritis for 40 years gave a history of thyroidectomy 17 years previously with residual paralysis of the vocal cord(s), dysphagia for 1 month, and marked pain on swallowing for 3 weeks prior to admission.

Sudden onset of severe dyspnea and a brief period of retrosternal chest pain with radiation into the left arm resulted in her admission to a local hospital. Although dyspnea subsided to the extent that an emergency tracheostomy was not necessary, and no evidence of a myocardial infarction was found, she remained essentially bed-fast because of respiratory obstruction. There was wheezing localized to the larynx, as well as inspiratory and expiratory stridor which were more prominent during sleep. Indirect laryngoscopy revealed a fixed posterior commissure 1 mm. in width. During a 2-week hospitalization dyspnea and hoarseness increased, but she repeatedly refused a tracheostomy. Following transfer to this institution she continued to exhibit marked dyspnea at rest and finally consented to a tracheostomy, which was performed under local anesthesia.

After unsuccessful efforts to improve her pulmonary status, general anesthesia was administered via her tracheostomy for direct laryngoscopy. The vocal folds were closed over the cords and the entire area seemed to be fibrosed. There was little or no movement of the arytenoids, and no airway could be seen. Because of her poor general condition a definitive operation was not done and the tracheostomy was left in place. She remained in the hospital with little or no improvement until her death from acute, rheumatoid, fibrinous pericarditis.

Figure 3 reveals the marked degenerative changes in her larynx, showing almost total destruction with resultant scarring and fixation of the right cricoarytenoid joint.
CURRENT COMMENT

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DISCUSSION

The characteristic manifestations of cricoarytenoid arthritis are listed in table 1. Exacerbations and remissions are not infrequent, the exacerbations usually occurring with a bout of arthritis or respiratory infection. Many of these patients give a history of unsuccessful treatment for “asthma,” or have been labeled as psychoneurotics.

During an acute arthritic bout, pain upon swallowing and laryngeal tenderness may become manifest, the result of inflammatory, or edematous changes in the cricoarytenoid joint.

Practically all cases have inspiratory stridor which is more marked during sleep or when the patient is relaxed. Apparently this is due to a loss of compensation. Although hoarseness may be present during acute inflammatory involvement of the arytenoids, it is not otherwise found because the vocal cords are maintained in adduction, causing little impairment of vocalization. This is unfortunate, since hoarseness would focus attention on the larynx.

Generally there is a history of mild exertional dyspnea which progressively worsens. When a patient presents with a marked airway obstruction and a superimposed respiratory infection, hypoxia and cardiovascular collapse may rapidly ensue. Polisar \(^1\) reported a patient in a comatose state twice within three days. If the patient is first encountered during a severe pneumonia, the life-threatening component may be masked, particularly while a tracheostomy is in place.

Ankylosis of the joint with marked narrowing of the rima glottidis can make orotracheal intubation difficult, or almost impossible without concomitant laryngeal damage. In this situation tracheostomy is preferable. Traumatic intubation after a corrective procedure for laryngeal stenosis has also been reported in which a wire suture was disrupted, resulting in laryngeal irritation.\(^2\) It therefore follows that this group of patients should be carefully evaluated in regard to orotracheal intubation.

One of the problems in early diagnosis has been lack of awareness of this entity during the evaluation of a patient. Although rheuma-

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Fig. 2. The larynx of a 48 year old white man as seen through an anterior thyrotomy incision. Following orotracheal intubation by a lay person as a life-saving procedure, this patient exhibited marked, intermittent lower airway obstruction for 5 years before consenting to corrective surgery. Photograph A reveals the marked laryngeal obstruction caused by the superior displacement and fixation of the right arytenoid cartilage. Photograph B shows the restored airway after a right arytenoidectomy.

<table>
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<tr>
<th>TABLE 1. Clinical Manifestations</th>
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<tr>
<td>1. History of refractory “asthma”</td>
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<td>2. Dysphagia, odynophagia, and laryngeal tenderness</td>
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<td>3. Inspiratory stridor</td>
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<td>4. Hoarseness</td>
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<tr>
<td>5. Dyspnea</td>
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<td>6. Lower airway obstruction</td>
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Fig. 3. Coronal (frontal) section, right half of the larynx from a 61 year old Caucasian female with severe, generalized rheumatoid arthritis revealing eburnation of the cartilages, marked fibrosis, and almost complete loss of the right cricoarytenoid joint.

toid arthritides are suspect, any patient who presents with a refractory "asthmatic" condition and inspiratory stridor, in whom cardiac and pulmonary pathologic conditions can be reasonably ruled out, should be examined for laryngeal obstruction. Direct laryngoscopic testing for passive mobility of the arytenoids as described by Jackson is the only method of making this diagnosis. This will rule out paralysis of the recurrent laryngeal nerve(s) in which the arytenoid(s) are freely movable.

Initial treatment consists of a tracheostomy, either for acute obstruction or in preparation for a definitive operation. An adequate airway and a useful voice are then provided by arytenoidectomy or arytenoidopexy.

Dr. C. W. Taylor, Jr., U. S. Naval Hospital, Bethesda, Maryland, provided the pathologic material, and Dr. Gabriel Tucker, Jr., Temple University, Philadelphia, Pennsylvania, processed the tissues.

References


A Statement by the American Board of Anesthesiology

One of the major concerns of the American Board of Anesthesiology is the certification of competent anesthesiologists. The Board believes it timely to present the criteria on which its judgment of competence is based. These include:

1. **Technical Facility.** Facility in providing all technical services is likely to be required in the practice of the specialty.

2. **Medical Judgment.** Ready availability of mature medical judgment applicable to solution of medical problems associated with a patient's care as they arise in the practice of the specialty.

3. **Scholarship.** The talent, training and habits of study necessary for evaluating and applying appropriately new knowledge.

For the present the Board accepts the definition of anesthesiology as submitted to the United States Department of Labor, recognizing that this definition is likely to change with time.

"Anesthesiology is a practice of medicine dealing with (1) the management of procedures for rendering a patient insensible to pain during surgical operations; (2) the support of life functions under the stress of anesthetic and surgical manipulations; (3) the clinical management of the patient unconscious from whatever cause; (4) the management of problems in pain relief; (5) the management of problems in cardiac and respiratory resuscitation; (6) the application of specific methods of inhalational therapy; (7) the clinical management of various fluid, electrolyte, and metabolic disturbances."