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Radiographic Documentation of Increased Visibility of the Larynx with a Belscope Laryngoscope Blade

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AN angulated laryngoscope, the Belscope, for use in patients in whom tracheal intubation was difficult, was developed and introduced by Bellhouse.[1] Mayall[2] was able to convert all of 12 cases of Cormack and Lehane[3] grade 3 to grade 2 or better by using the Belscope. Benumof,[4] in contrast, does not consider the Belscope blade superior to the Macintosh or other currently used blades; he asserts that special skill or a prism may be required for difficult cases and furthermore that evaluation of these aspects of its use has not been complete.

Recently, we treated patient in whom intubation was difficult. We performed comparative analysis by means of a lateral radiograph of the line of vision with each blade.

Case Report

A 60-yr-old, 55-kg, 165-cm man was scheduled for nephrectomy during general anesthesia. In the preanesthetic interview we noted that the maxilla was slightly protruding and that the tongue was moderately enlarged (class 2 of classification by Mallampati *et al.*), suggesting the possibility of difficult intubation.[5] After induction of anesthesia with thiopental and vecuronium administered intravenously, we inserted a number 3 Macintosh blade into the right side of the mouth. Drawing the handle anterocaudally with the tip anterior to the epiglottis displaced the tongue to the left. Despite the more than 10-cm elevation of the head, the full sniff-positioning of the chin and face for full extension of the head on neck, and the application of external laryngeal pressure,[6,7] only the epiglottis could be visualized (Cormack and Lehane[3] grade 3). Therefore, it was decided that a Belscope blade should be used.

A medium Belscope blade was inserted on the midline in the same position as the Macintosh, and the tip of the blade was rotated anteriorly. This procedure was repeated until the tip reached the esophagus, and then the blade was withdrawn and the epiglottis was held forward, when the posterior end of the laryngeal aperture was partly exposed, without additional maneuvers such as external laryngeal pressure (Cormack and Lehane[3] grade 2).

Lateral radiographs were taken with each blade in place (fig. 1). Tracheal intubation was then successfully performed. All laryngoscopic procedures and intubations were performed by an anesthesiologist with 23 yr of experience (S.W.). The patient and his family were informed of this event after he was awake, and it was described in his medical record.

Discussion

Recently published, the "Practice Guidelines for Management of the Difficult Airway" states that the "difficult airway" has not yet been defined in the literature and emphasizes the importance of objective reporting for the sake of physicians and their patients.[8] However, it is difficult to photograph the different views of the glottis obtained with various rigid laryngoscope blades.

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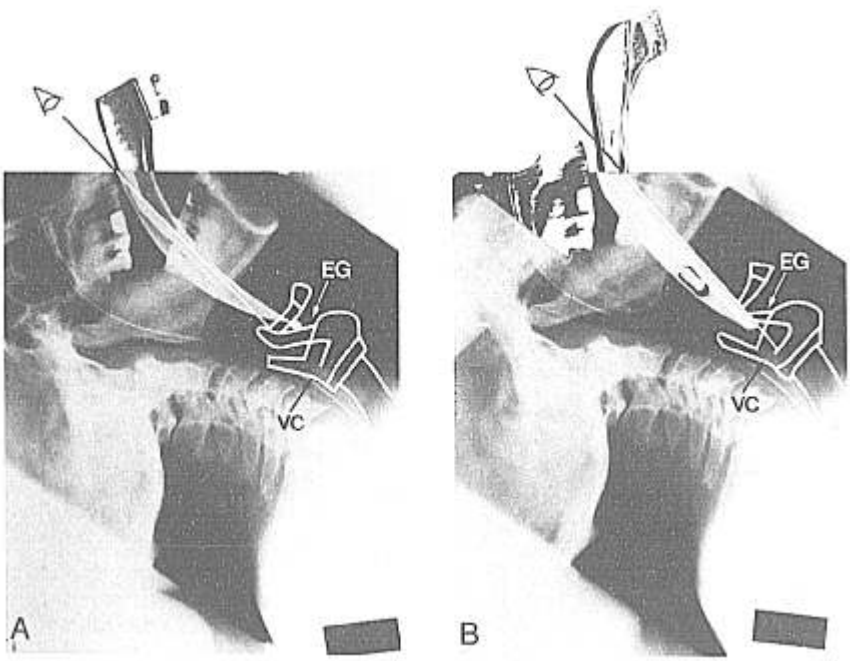

Fig. 1. Radiographs of Macintosh (*left*) and Belscope without prism (*right*) in one patient. The anterior part of the maxilla was reproduced by duplicating that of the right radiograph. Line drawing highlights the portion of the hyoid bone, epiglottis, and glottis including vocal cords. Although the tip of the Macintosh is closer to the hyoid bone than is the tip of the belscope blade, the Macintosh blade is not been able to displace the hyoid sufficiently to raise the epiglottis, and hence the larynx is not displayed (Cormack and Lehane grade 3). The Belscope, in contrast, elevates the epiglottis directly and provides a view of the posterior part of the larynx (Cormack and Lehane grade 2). The neck flexion angle (angle between the bottom line of the radiograph and the anterior surface of the trachea) was 40°. Sniff positioning was optimal. VC = vocal cord; EG = epiglottis.

The Macintosh laryngoscope blade has a curvature of almost 30° and fits snugly to the bulky tongue musculature. However, in this particular case the curvature impaired visibility. Radiographs revealed that visibility was improved with the Belscope, without a prism.

Even with our limited experience, we believe that there is no need for a prism or special maneuvering of the blade in most cases when using the Belscope. Bellhouse does not emphasize the necessity of a prism for obtaining increased visibility in patients in whom intubation is difficult. He recommends a right lateral approach rather than a midline approach: rigid laryngoscopes can be drawn further anteriorly, providing the best view of the larynx when they traverse the sulcus between tongue and tonsil.§ This approach was not necessary for this patient.

Another important issue is comparison with the Miller blade. The Belscope blade is essentially a straight blade. In cases in which insertion is not difficult, the laryngeal view is similar to that provided by a Miller blade. However, a Miller blade lacks an offset handle, unlike the Belscope. Therefore, the distance between the upper teeth and the vertical portion is less than that provided by the Belscope. The smaller distance prevents the larynx from being visualized in some patients. If the mandible is forcibly drawn anteroinferiorly, a risk of dental damage occurs. When the Belscope is used, the upper lip may partially obstruct the field of view because of it draws the mandible further anteroinferiorly than with other types of blades, including a Miller blade. This characteristic of the Belscope, resulting in awkward lip placement, is easily overcome by having an assistant retract the lip to provide a better view of the larynx than is possible with the straight blade.

We believe that for patients in whom tracheal intubation is difficult, the Belscope blade may be a useful instrument as an alternative for the Macintosh blade when the glottis cannot be visualized.

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Transient Paraparesis after General Anesthesia in a Patient in the Prone Position

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IT is widely recognized that patient position and general anesthesia may precipitate neurologic deterioration in patients with cervical spine injury and impending cervical cord injury. The influence of position and sedation on thoracic and lumbar spinal cord functioning is less commonly a clinical problem.

We report a case of transient paraparesis associated with prone positioning during general anesthesia.

Case Report

An 8-yr-old, 27-kg girl underwent posterior fossa craniotomy for resection of a grade 1 pilocystic astrocytoma of the obex and fourth ventricle. Her hospital course had been notable for repeated ventriculoperitoneal shunt malfunctions and revisions.

Three months after craniotomy, during a follow-up clinic appointment, she complained of severe position-related back pain of 2 weeks' duration. The pain occurred with assumption of the supine position and was localized to the lower back just below the level of the iliac crests. She also complained of bilateral sacroiliac joint tenderness. Palpation of the sacroiliac joints resulted in pain at each respective groin. Neurologic examination demonstrated a decrease in the sense of vibration at the right great toe without changes in coordination or deep-tendon reflexes. Motor strength and light-touch sensation of the lower extremities were intact. She had limited cervical spine flexion, a stooped posture with knees slightly flexed, and a forward-leaning stance with the waist in notable flexion. This posture was exaggerated with walking. She could assume an erect posture but could not maintain it because of rapid onset of fatigue. She denied having pain on standing or walking.

The patient received tricyclic antidepressant agents and nonsteroidal antiinflammatory drugs but with minimal benefit. Because of her history of back pain without neurologic symptoms, she was scheduled for elective outpatient magnetic resonance imaging (MRI) in accordance with a management algorithm described by Portenoy *et al.*[1] Her back pain increased during the subsequent week with a concomitantly worsening sleep disturbance. She was able to sleep only in semirecumbency with several pillows for support. Therefore she was admitted for urgent MRI and multidisciplinary pain management.

The patient underwent the MRI while in the supine position. The knees were flexed and the lower extremities were supported on a pillow to improve comfort. Noninvasive monitors were placed, and a continuous intravenous propofol infusion was titrated to effect. The MRI revealed extensive tumor involvement and significant compression of the anterior aspect of the spinal cord from the T6 vertebra to the S1 vertebra (fig. 1). The patient was taken to the postanesthesia care unit after completion of the MRI procedure. Recovery was without incident. MRI was repeated 48 h later with the same anesthetic technique and the patient again in the supine position. She was awakened and had an uneventful recovery.

The decision to begin palliative radiation therapy was made. It was deduced that the staging for radiation therapy ports would be most effective if the patient were placed in the prone position.[2] After routine noninvasive monitors were placed, the patient was sedated with midazolam while in the semisitting position because the supine posture was intolerable. Intravenous propofol was administered until

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