spondyloepiphyseal dysplasia tarda, and campomelic dysplasia deserve further comment.

The authors state in the appendix that patients with pseudoachondroplasia have normal cervical spines. This is in direct contradiction to one of the cited appendix references[2] and also conflicts with earlier work by one of the authors.[3] In both of these references, odontoid hypoplasia is noted in pseudoachondroplasia, and Perovic *et al.*[5] reported that three of their four patients with this combination of findings had cervical spine instability. Similarly, patients with diastrophic dysplasia and spondyloepiphyseal dysplasia tarda are noted by Berkowitz *et al.* as having normal odontoid processes or completely normal cervical spines, respectively.[1] Odontoid hypoplasia and its attendant problems are less common in these patients than in those with one of many other types of disproportionate dwarfism, but they have been reported.[2,4] Other cervical spine problems are mild but may progress over time.[5] Finally, patients with campomelic dysplasia virtually always have cervical spine problems, often severe.[6] Preoperative evaluation of the cervical spine, including complete odontoid evaluation, is important in all of these patients,[7] especially considering the likelihood of difficult intubation. Practitioners encountering a patient with any disproportionate dwarfism are well advised to be extremely conservative in their approach to the cervical spine and to intubation.

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REFERENCES

1. Berkowitz ID, Raja SN, Bender KS, Kopits SE: Dwarfs: Pathophysiology and anesthetic implications. ANESTHESIOLOGY 73: 739–759, 1990
2. Wynne-Davies R, Hall CM, Apley AG: Atlas of Skeletal Dysplasia. Edinburgh, Churchill Livingstone, 1985
3. Perovic NN, Kopits SE, Thompson RC: Radiological evaluation of the spinal cord in congenital atlanto-axial dislocation. Radiology 109:713–716, 1973
4. Weinfeld A, Ross MW, Sarasohn SH: Spondylo-epiphyseal dysplasia tarda: A cause of premature osteoarthritis. Am J Roentgenol 101:851–859, 1967
5. Langer LO: Spondyloepiphysial dysplasia tarda. Radiology 82: 833–839, 1964
6. Hall BD, Spranger JW: Campomelic dysplasia. Am J Dis Child 134:285–289, 1980
7. Wynne-Davies R, Hall CM, Apley AG: Skeletal dysplasia group: Instability of the upper cervical spine. Arch Dis Child 64:283–288, 1989

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In Reply:—Dr. Audenaert has correctly pointed out misquotations in the appendix of our review[1] in regard to cervical spin abnormalities of patients with pseudoachondroplasia, diastrophic dysplasia, spondyloepiphyseal dysplasia, and camptomelic dysplasia. We agree with his comment that the preoperative evaluation of the cervical spine is important in the above groups of patients as well as in other patients with disproportionate dwarfism.

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REFERENCE

1. Berkowitz ID, Raja SN, Bender KS, Kopits SE: Dwarfs: Pathophysiology and anesthetic implications. ANESTHESIOLOGY 73: 739–759, 1990

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An Aid for Simultaneous Instructor and Trainee Viewing of Orotracheal Intubation

To the Editor:—Tracheal intubation is among the most important techniques that anesthesia trainees learn during graduate medical education. Yet anyone who has attempted to teach this skill and to view laryngoscopy from a distance (*e.g.*, over the shoulder) knows how difficult it is to confirm just exactly what the student is visualizing. We report a simple modification of readily available tools that will assist those teaching laryngoscopy and tracheal intubation while affording a continuous and direct view of the procedure.

A standard curved laryngoscope blade is modified (fig. 1) by drilling two sets of 1.5-mm holes to allow attachment of an intubating fiberoptic bronchoscope (Olympus LF-1). Each parallel set of holes is 4–5 mm apart, with the sets distanced 5 and 9 cm from the tip of the blade. The fiberoptic bronchoscope is attached loosely through these holes with rubber bands, still allowing some flexion of the scope's tip.

Assembled prior to induction, the blade is attached to a standard handle and the bronchoscope attached to a light source. Once placed into the oropharynx by the student, the teacher may follow exactly where the laryngoscope travels. No oral airway is required to protect the fiberoptic attachment, since the laryngoscope prevents jaw closure. Several advantages are noted with this apparatus: Lighting conditions are supplemented by the attached fiberoptic light source compared to the traditional battery handle, providing maximal viewing. The teacher can scan (roughly a 75° field of view with a 240° arc, for the Olympus LF-1) the periglottic area to note abnormalities the student might miss,

direct the student to the tracheal orifice, and confirm the correct placement of an endotracheal tube. Attachment of other devices to the fiberoptic head (such as still or video cameras) allows recording of laryngoscopy for later viewing. Oxygen can be insufflated through the bronchoscope side port during the teaching procedure, increasing the time allowed for intubation.[1] In addition, other students preparing to practice true fiberoptic laryngoscopy will benefit from viewing direct laryngoscopy with this technique, which will demonstrate the anatomy to be encountered.

Alternatively, a straight laryngoscope blade may likewise be modified with three sets of 1.5-mm holes drilled 0.5, 4, and 9 cm from the tip (fig. 2). Because the attached fiberoptic scope is more proximal to the tip, a closer and more detailed view of the larynx is possible than with the curved blade.

Obviously, our fiberoptic laryngoscope blade suffers from the difficulties inherent to fiberoptic scopes in general, such as fogging of the lens or interference by secretions. In addition, fixation to the laryngoscope blade limits the bronchoscope's mobility (*e.g.*, limited flexion and no rotation), and the quality of view obtained depends heavily on proper placement of the laryngoscope. The presence of the bronchoscope itself has the potential for obstructing the line of sight of the direct laryngoscopist. However, we have found ample area both inferiorly and laterally to visualize the laryngeal aperature, since the bronchoscope "hugs" the inferior surface of the laryngoscope blade well above the laryngoscopist's view. The tip of the bronchoscope can also impinge on the posterior pharyngeal wall, but this is avoided by displacing the tongue anteriorly and not using excessive force if resistance is met.

Having used this device several dozen times with both resident and attending staff, we note that our ability to teach laryngoscopy is greatly enhanced, as we can safely direct the learner throughout the manuveuring of the laryngoscope and simultaneously know exactly where the laryngoscope is placed.

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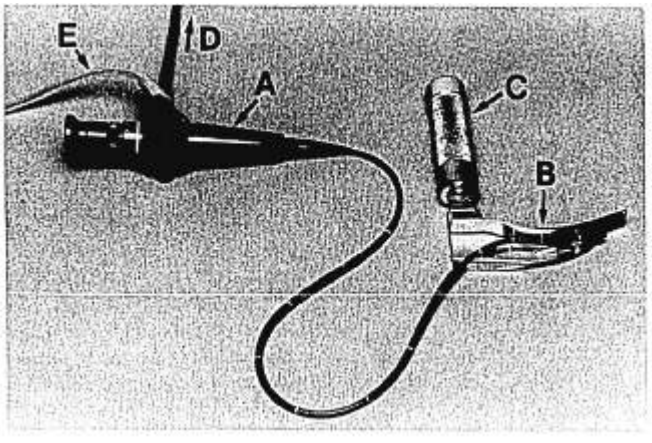

FIG. 1. The fiberoptic bronchoscope (*A*) is attached to two sets of holes drilled in curved laryngoscope blade (*B*). The standard handle (*C*) and bronchoscope light source (*D*) are assembled. Oxygen may be insufflated into suction port (*E*).

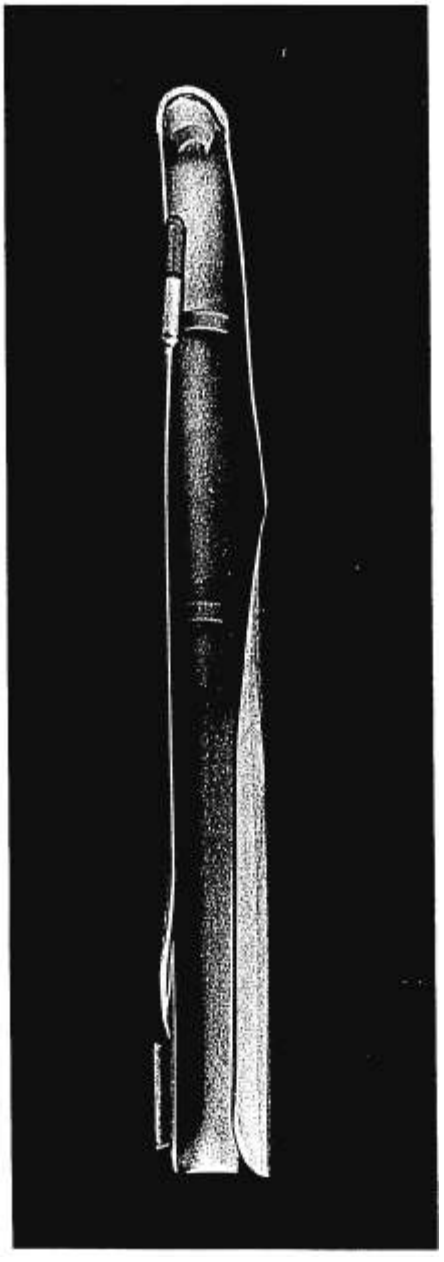

FIG. 2. A straight laryngoscope blade is modified for fiberoptic bronchoscope attachment.

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REFERENCE

1. Rosen DA, Rosen KR, Nahrwold ML. Another use for the suction port on the pediatric flexible bronchoscope. ANESTHESIOLOGY 65:116, 1986

(Accepted for publication March 28, 1991.)