Laryngeal characteristics after reconstruction for subglottic stenosis: a clinical correlation

Donald B. Kearns, M.D., Andrew R. Grace, F.R.C.S., David S. Parsons, M.D., C. Martin Bailey, B.Sc., F.R.C.S. and J. N. G. Evans, F.R.C.S. (London)

The sixteen children who were studied, consisted of three with congenital subglottic stenosis and thirteen with acquired stenosis. This ratio reflects our most recent experience with this problem at Great Ormond Street. Tracheooesophageal fistulae were noted additionally in three of these children.

Our study reflects a rather unusual group of children as 25 per cent were referred from other centres as operative failures. Operative intervention necessary to decannulate these patients reflects the severity of this problem as one third of this group required three procedures before they could be decannulated. One third in a similar fashion required two procedures, while the remaining one third required only one intervention.

The surgery performed consisted of one or more variations of four procedures. These are all previously described and will be discussed later. They consist of the laryngotracheoplasty, anterior or posterior rib cartilage graft to the larynx and trachea, and anterior and posterior rib cartilage grafts in the most severe cases.

The average age at the first operation of these children was 41 months and the average age at decannulation was 61 months. The average length of cannulation was 58 months. These figures are somewhat unrepresentative as one child was eight years of age when first seen and another was 16 years old when first referred to Great Ormond Street.

The post-decannulation voices of these children have been categorized by subjective and objective criteria, as previously mentioned. These categories include acceptable, moderately abnormal and severely abnormal voices. Children with acceptable voices had either one or two procedures performed prior to decannulation, with a mean of 1.4 operations. Children noted to have moderately abnormal voices post-operatively had required either two or three procedures to allow decannulation, with an average of 2.3 operative interventions. Patients with a post-operative severely abnormal voice had either one or two procedures before decannulation, with a mean of 2.2 operations.

We could not note any correlation between the type of voice and type of procedure performed. All voice categories contained children with each of the four previously noted procedures. We could find no correlation between voice type and the date of the operation or the age at first surgery. We did note that children cannulated the longest had the worst voices after decannulation. Children with congenital subglottic stenosis had uniformly better voices post-operatively; two of these children had acceptable voices, while one was classified as moderately abnormal.

Fibreoptic nasolaryngoscopy was performed on nine of the 16 children. These were older children who could co-operate with the procedure and included two in the severely abnormal group, four in the moderately abnormal group and three in the acceptable voice group. Findings included anterior blunting of the vocal folds to some extent in all the children with less then acceptable voices. False cord phonation was noted in two patients with moderately abnormal voices. Anterior overfolding of the arytenoids was noted in two children with moderately abnormal voices and in both the children with severely abnormal voices. Poor or limited movement of one or both arytenoids was noted in one child with a moderately abnormal voice and both children with severely abnormal voices. It is important to note however that we have observed all of these abnormalities, other than anterior blunting, in a child with acquired subglottic stenosis who has not undergone any surgical procedure.

We noted poor correlation between our findings at microlaryngoscopy under general anaesthesia and those appreciated during awake endoscopy. Awake endoscopy provided information about the phonatory dynamics and functional state of the larynx, impossible to assess while the child is anaesthetised or during awakening.

From the Department of Otolaryngology, The Hospital for Sick Children, Great Ormond Street, London WC1N 3JH