Supraglottoplasty is the gold standard treatment for laryngomalacia. The tools traditionally used in these types of interventions range from cold steel (2) and microdebriders (3) to different types of lasers (4). We propose and outline a procedure protocol with a surgical case report for supraglottoplasty performed using a Harmonic scalpel (Fig. 1) in a male patient with short aryepiglottic mucosal folds - type 2 laryngomalacia (5) (Fig. 2).

Figure 1 – The Harmonic scalpel used during the procedure as compared to the size of the head of the patient (items in figure are to 40% scale).

Figure 2 – The patient’s laryngeal complex prior to the surgical intervention - severely constricted laryngeal aperture and short aryepiglottic mucosal folds.

**Materials and methods:**

An otherwise healthy, two months old, male patient was referred to the ENT department at “St. Marina” University Hospital - Varna, Bulgaria with a history of stridor since birth (1). Laryngomalacia was diagnosed by means of laryngeal endoscopy under general anaesthesia (5). Bilateral, instead of unilateral (6), supraglottoplasty was chosen as an intervention, as it was considered optimal for a yet unestablished protocol. The procedure was carried out when the patient was 23 months of age with the parent’s consent. General trans-nasal intubation anaesthesia was used. The leading surgeon held both the Macintosh direct laryngoscope and the harmonic scalpel, while the assistant held a 30 degree rigid endoscope (Fig. 3). Postoperatively the patient was transferred to the children and neonatal intensive care unit for monitoring for a period of 24 hours (7).

Figure 3 – The procedure in progress. The surgical field and route of instrument entry are sufficient for the armamentarium even in a patient of this age.

The described surgical protocol was carried out with ease by a team of two ENT surgeons in a child of this age and rate of development. The Harmonic scalpel allowed for an effective and bloodless division (8) of the aryepiglottic folds with up to two applications (Fig. 4) after which the laryngeal complex widened and extended immediately (Fig. 5). Postoperatively the child was extubated in the operating room with an immediate resolution of the stridor and no symptoms of aspiration (7) with spontaneous non-problematic breathing. Three months postoperatively a control sleep endoscopy was performed and showed improved anatomical relations of the laryngeal complex and a widened laryngeal aperture with no signs of scarring at the resected aryepiglottic folds, no recurring symptoms, no onset of aspiration and other possible complications, common after such types of procedures (9).

Figure 4 – The patient’s laryngeal complex prior to the first harmonic scalpel application. The shape and size of the applicator are sufficient for proper tissue reduction with a minimal number of applications.

Figure 5 – The patient’s laryngeal complex after the surgical procedure – the now separated aryepiglottic folds and the widened laryngeal aperture with the absence of damage to nearby structures.

**Results:**

The procedure protocol proved to be relatively easy to perform in a patient of this age and state of development by a two surgeon team. The size and shape of the harmonic scalpel shaft (23cm) as a whole did not pose a difficulty for the surgical team and protocol. The applicator blade of the harmonic scalpel proved to be borderline appropriate in shape and size (1.5 cm in length) for the procedure, regarding the size of the laryngeal complex and volume of tissue resection needed in a patient of this age and state of development, for a sufficient correction. In other instances this might present as a drawback for the protocol, in the instance of younger patients, where the laryngeal complex and the volume of tissue resection are both considerably smaller. The nature of the Harmonic scalpel allowed for a fast and tissue effective approach with minimal damage to nearby structures. The lack of intra- and postoperative bleeding (8) and local oedema allowed for a faster patient recovery and restoration of normal laryngeal function with lack of aspiration, commonly developing after similar procedures performed with other surgical tools (9). Postoperatively no long term complications, such as recurrence of the stridor, fibrosis, constriction and other conditions demanding a reoperation and further laryngoplasty developed.

**Discussion:**

The proposed surgical protocol does not deviate from the already established ones for supraglottoplasty (10), apart from the described armamentarium. Based of the ease of performance, surgical precision and postoperative results, the use of Harmonic scalpel in the surgical treatment of laryngomalacia appears to be a safe, practical, affordable and easily applicable alternative.

**References:**