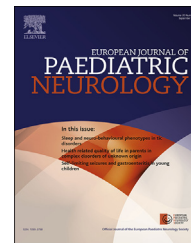




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Original Article

Bilateral transcervical submandibular gland excision for drooling: A study of the mature scar and long-term effects



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ABSTRACT

Aim: Several surgical techniques are available to treat drooling in neurologically disabled children and adolescents, with bilateral submandibular gland excision being the only transcervical procedure. External scars can be a reason to decline for this surgical approach. We investigated which factors influenced caregiver satisfaction by evaluating the long-term scar in relation to treatment outcome.

Methods: We identified a historical cohort, in which all neurologically disabled patients who underwent bilateral submandibular gland excision for drooling between January 2009 and December 2013 were identified ($n = 41$). The Patient and Observer Scar Assessment Scale (POSAS) was used to evaluate observer and clinician satisfaction. All included patients were contacted by telephone and completed a digital questionnaire that included digital images of the scars.

Results: Of the caregivers that responded the questionnaire 76% (19/25) were satisfied with the overall outcome. Twenty-four (96%) caregivers considered the scars acceptable. Caregiver satisfaction was not correlated to the appearance of scars, but was significantly correlated with the decrease in drooling severity on a visual analogue scale ($p = 0.035$) and decrease in lower respiratory tract infections ($p = 0.042$).

Interpretation: The appearance of scars does not influence satisfaction after bilateral submandibular gland excision for drooling. As expected, satisfaction is correlated to the treatment outcome.

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Abbreviations: SMGE, Submandibular glands excision; POSAS, Patient and Observer Assessment Scale; VAS, Visual Analogue Scale.

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1. Introduction

Drooling is a common problem in patients with cerebral palsy (CP) as approximately 40% of patients exhibit this symptom.¹ From a clinical point of view it makes sense to distinguish between anterior or posterior drooling. Anterior drooling is characterized by saliva spilled from the mouth that is clearly visible. Posterior drooling is defined as the spill of saliva over the tongue through the oropharyngeal isthmus, causing aspiration and associated pneumonias. Anterior and posterior drooling may occur at times in the same individual.²

Botulinum toxin A injections into the salivary glands has over the years emerged as an important intervention in the treatment of drooling. Botulinum toxin A inhibits the release of acetylcholine, and thereby causes temporary functional denervation of the salivary glands. This results in a reduction of salivary flow for approximately 6 months, which in most aging patients eventually leads to a surgical, more permanent, treatment.^{2–4}

In the surgical treatment of drooling, an intraoral and/or transcervical approach can be employed. Intraoral submandibular duct relocation with simultaneous sublingual gland excision is currently the preferred technique for persistent anterior drooling.⁵ This procedure is contraindicated in children who suffer from posterior drooling or from progressive pharyngeal dysphagia. In these patients, bilateral submandibular gland excision (SMGE) with bilateral parotid duct ligation is an alternative option.^{6–8} However, xerostomia may be a problem in the combined approach, affecting 9% of the patients.⁹ Therefore, we use a step-wise, less invasive surgical approach beginning with SMGE, which can be followed by treatment of the parotid glands, if drooling persists after SMGE.

SMGE is an effective treatment for drooling.^{10–12} Studies investigating SMGE for other indications such as sialadenitis show that this procedure carries low risk for adjacent nerve structures and incurs little aesthetic damage.¹³ Cosmetic complaints caused by damage to the mandibular branch of the facial nerve reportedly affect 0–7.7% of patients. Permanent damage to the lingual nerve occurs in 0–4.4% of patients and to the hypoglossal nerve in 0–2.9%.^{13–15} Patient satisfaction with the cosmetic and long-term outcomes after SMGE to treat drooling have rarely been reported, but remains an important consideration in choosing this surgical approach, as it is the single technique using a transcervical approach.^{10,11}

Parent questionnaires are particularly important for evaluating the treatment outcome.¹⁶ The Patient and Observer Scar Assessment Scale (POSAS) is an appropriate subjective tool for evaluating linear scars.¹⁷ It encompasses three dimensions as follows: (a) physical characteristics, (b) cosmetic appearance, and (c) symptoms.^{17,18} Satisfaction with scars is influenced by scar-related symptoms such as symmetry, pain and itching,^{19,20} as well as by psychosocial distress, quality of life and the postoperative recovery.^{20–22} Scars usually develop 6–8 weeks after epithelialization and at least 6–18 months is required for the scar to mature.²³ This period must be considered before evaluating the surgical outcome using the POSAS.

In this study, we evaluate whether the satisfaction of parents and caregivers after SMGE is influenced by the cosmetic result. Our hypothesis is that the long-term effect on drooling after surgery is the major variable influencing parental and caregiver satisfaction. We examine whether the disadvantages of surgery, including scarring, outweigh the benefits of this procedure. This is of special importance due to the vulnerability of the patient population, who are legally incapable of making medical decisions.

2. Materials and methods

2.1. Participants

Patients who underwent SMGE were recruited from the Radboud University Medical Centre Drooling database during the 5-year period from 1 January 2009 to 31 December 2013. Ethical approval for the study was granted by the Regional Ethics Committee. Informed written consent was obtained from all patients and parents or legal guardians.

Patients (children, adolescents and young adults with a neurologic impairment) who underwent transcervical bilateral SMGE to treat drooling more than one year prior to study enrolment were included. Patients who underwent previous salivary gland surgery were excluded.

2.2. SMGE procedure

A skin incision approximately 5-cm long located 4 cm below the mandible was made under general anaesthesia. The platysma muscle was separated, and the lower border of the salivary gland was exposed. The facial artery and vein were spared if possible. The mandibular branch of the facial nerve was not identified but spared by extracapsular dissection of the submandibular gland. The lingual and hypoglossal nerves were identified and spared. Operative technique was similar for all patients, and the skin was closed in the same manner in all patients (3.0 Vicryl subcutaneously and 4.0 Monocryl intracutaneously). All procedures were performed by a single surgeon (FH). Postoperative wound management was similar in all patients and included placement of a bilateral harmonica drain for one day.

2.3. Study design

We identified a historic cohort and collected data prospectively. Parents or caregivers were contacted by telephone and instructed to complete a digital questionnaire on the cosmetic appearance of the scars, satisfaction with the procedure, complications and the long-term effect on drooling. The questionnaire was developed specifically for this study and included a validated scar assessment questionnaire (POSAS v2.0/NL). Caregivers were asked to send a digital photograph of the scars on both sides (Fig. 1). These photographs were evaluated by a three-member panel. Clinical characteristic data were obtained from the medical records.

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