



Review Articles

Which surgery for drooling in patients with cerebral palsy?

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Abstract

Background: Surgery for drooling in patients with cerebral palsy should not produce xerostomia in order not to deteriorate speech, taste, or the status of oral hygiene. It must be a compromise between drooling and quality of life. The purpose of the present report is to describe our surgical strategy that respects the above principles.

Materials and Methods: Patients were initially operated on depending on the drooling severity. The results were evaluated according to the frequency of residual drooling and the Thomas-Stonel and Greenberg classification. Quantitative assessment was proposed 6 months after surgery. The data have been compared using the nonparametric Wilcoxon matched-pairs test.

Results: Thirty-five patients underwent surgery between 1991 and 2012. Owing to incomplete data, only 31 patients could be included, aged 5 to 24 years (mean: 12 years). All patients underwent surgery on the submandibular duct. Only 16 patients underwent a simultaneous surgery on the parotid duct. Six patients were reoperated: 3 because of an insufficient result and 3 because of a surgical complication. Changes/Day ranged from 1 to 7 (median: 3) before surgery and 0 to 2 (median: 1) after surgery ($p < 0.01$). Number of bibs/day ranged from 0 to 30 (median: 4) before surgery and 0 to 4 (median: 1) after surgery ($p < 0.01$). No dental deterioration and no caries occurred after surgery.

Conclusion: Good results for drooling can be obtained with a simple surgical procedure on the submandibular ducts, maintaining quality of life, avoiding deterioration of speech, taste, and the status of oral hygiene.

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Salivary incontinence or drooling is the continuous spillage of saliva over the lower lip. It is a major impairment in nearly 10% of patients with cerebral palsy [1]. It wrongly evokes mental retardation and its psychological, school and professional consequences are a heavy burden for those

involved in the care of these patients, the patients themselves and their parents.

The purpose of the present report is to describe our surgical strategy for drooling patients with cerebral palsy.

1. Patients and methods

A retrospective analysis of surgical procedures proposed to patients with cerebral palsy was carried out. The transposition of parotid ducts was as follows: after cannulation

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of the right parotid duct, a mucosal flap was drawn in the cheek and dissected. Once the flap was tubularized, it created a new, longer parotid duct. The posterior line of flap dissection must extend 0.5 cm beyond the orifice. The mucosal flap was made with a continuous resorbable monofilament suture. The flap was tunneled by rerouting the flap anteriorly or posteriorly to the pterygomaxillary muscle, with suturing of the new flap orifice to the superior pole of the anterior tonsillar pillar. The transposition of the submandibular ducts was carried out as follows: after the location of the submandibular duct caruncula, the gingival–lingual crease was opened, followed by Wharton duct dissection, and rerouting of the submandibular duct with suturing of the caruncula to the inferior aspect of the anterior tonsillar pillar [2].

All patients were examined 1 year after surgery. Data from hospital records were reviewed. The results were evaluated according to the frequency of residual drooling and the Thomas-Stonell and Greenberg classification (TSG classification) [3]. Each patient was assigned a grade according to the following definitions: A, dry, never drools; B, mild, only the lips are wet; C, moderate wet on the lips and chin; D, severe, drools to the extent that clothing becomes damp; and E, profuse, clothing, hands, tray and objects become wet. Frequency of drooling was ranked as 1, never drools; 2, occasional drooling; 3, frequent drooling; and 4, constant drooling. Quantitative assessment was evaluated using the number of changes per day and number of bibs per day. Each patient was assessed regarding to their grade and frequency of drooling and the number of changes and bibs per day before surgery and 6 months after surgery. As normality assumption has been rejected the data have been compared using the nonparametric Wilcoxon matched-pairs test with type I error set to 0.05.

2. Results

Thirty-five patients underwent surgery for drooling between 1991 and 2012. Owing to incomplete data, only 31 patients could be included. They were 10 females and 21 males aged from 5 to 24 years (median 12 years). All patients presented with constant and profuse sialorrhea. We began our experience with the transposition of parotid ducts. This procedure was progressively abandoned. Indeed, only 30% of the total daily salivary secretion was concerned whereas it was a very painful surgical procedure because of the extensive dissection. Excision or ligation of the submandibular ducts was offered to complete the result obtained with the bilateral parotid duct diversion. Then, transposition of the submandibular ducts was proposed alone or completed by surgery on the parotid duct. Our patients underwent surgery on the submandibular ducts: 26 transpositions, 2 excisions and 3 ligatures. During dissection of the

submandibular ducts, bulky sublingual glands were removed in 6 patients. Only 16 patients underwent simultaneous surgery on the parotid ducts: 7 bilateral transpositions and 9 unilateral ligations.

Six patients required reoperation. For three patients, it was because of an insufficient result. They underwent a bilateral parotid duct diversion. For the three remaining patients, it was because of a surgical complication: either a salivary collection in the cheek (two cases) because of a parotid duct obstruction after transposition, or a salivary collection under the tongue (one case) because of sublingual gland dilation after dissection and transposition of the submandibular duct.

Before surgery, patients rated as D (71%) or E (29%), grade 4 (100%) according to the TSG classification. After surgery, patients were evaluated A (39%) or B (61%), grade 1 (36%) or 2 (64%) according to the TSG classification, depending on the moment during a day.

Changes per day (t-shirts, clothes) ranged from 1 to 7 (median 3) before surgery and 0 to 2 (median 1) after surgery ($p < 0.01$) (Fig. 1). Number of bibs per day ranged from 0 to 30 (median 4) before surgery and 0 to 4 (median 1) after surgery ($p < 0.01$) (Fig. 2). No dental deterioration and no caries occurred after surgery.

3. Discussion

The neurologically damaged children do not produce excess saliva in comparison to the normal children. The problem appears to be a defect in the oral phase of deglutition [4]. For children whose drooling requires frequent changes of bibs or clothing, treatment is necessary. The therapeutic modalities available for the drooling children include

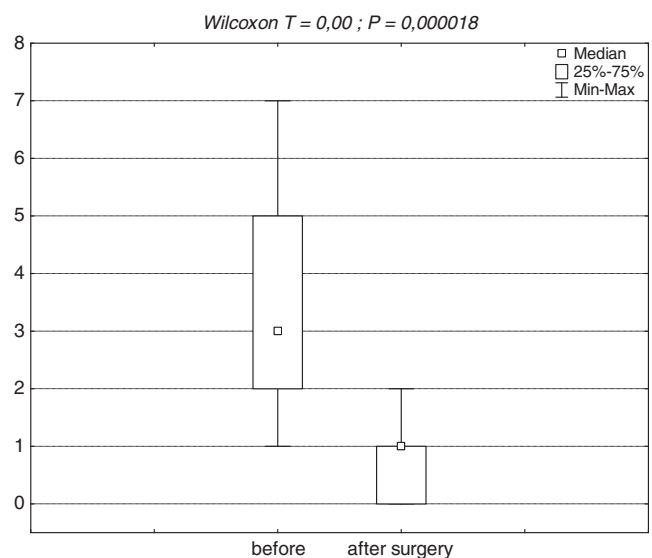


Fig. 1 The number of changes/day (median [min–max]) is 3 (1–7) before surgery and 1 (0–2) after surgery.

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