The Use of Diathermy Scissors in Parotid Gland Surgery

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Objective: To evaluate the benefits, as well as the possible complications, of the use of diathermy scissors in parotid gland surgery.

Design: Prospective study of the surgical procedures of the diathermy scissors and a retrospective comparison with a conventionally treated control group concerning cut-closure time.

Setting: Tertiary care referral academic center.

Patients: Prospective examination of 30 unselected patients undergoing superficial (n=23) or subtotal/total (n=10) parotidectomies performed with diathermy scissors. Indications were benign tumors (n=18), malignant tumors (n=12), and cystic lesions (n=3). In a control group (n=50), 36 superficial and 21 subtotal/total parotidectomies were performed.

Results: The use of diathermy scissors reduces the need to frequently change dissecting and coagulating surgical instruments. The scissors reduce intraoperative bleeding and therefore improve visualization and orientation in the surgical field. Postoperative bleeding or seroma and Frey syndrome were not observed. In 1 case, a salivary fistula was present for 3 weeks. Three cases of transient facial weakness occurred, all of which completely resolved by 6 months after surgery. In the control group, the cut-closure time ranged from 50 to 120 minutes (average, 87.6 minutes) during superficial parotidectomy; it ranged from 80 to 160 minutes (average, 130.0 minutes) during subtotal and total parotidectomy. In comparison, in the study group, the average time gain was 16 minutes during superficial parotidectomy when diathermy scissors were used, a statistically significant difference (P=.03). During subtotal and total parotidectomy with diathermy scissors, the average time gain was 19.3 minutes and was statistically not significant (P=.23).

Conclusions: The results of the present study show that diathermy scissors are very well suited for most of the surgical steps in parotid gland surgery. They provide an elegant, safe, and fast surgical procedure, especially in the hands of an experienced surgeon.

The use of the microscope made identification and preparation of the nerve branches safer and easier. After the nerve stem was definitively identified, the diathermy scissors were used almost continuously, for preparation, conventional cutting, conventional bipolar coagulation, and simultaneous cutting and bipolar coagulation. The bipolar intensity setting was 50 W. Additional intraoperative facial nerve monitoring was conducted in cases involving revision surgery and resection of malignant skin tumors of the cheek.

After surgery, the entire range of complications, especially hemorrhage, hematoma, seroma, salivary fistula, Frey syndrome, and facial nerve paralysis, was examined. Postoperative follow-up lasted for 12 months. Assessment of concomitant nerve impulses (caused by the scissors) and the possible adverse impact of facial nerve monitoring were of special interest. Required time for surgical preparation was examined retrospectively by comparison of the average cut-closure time in the study group with that in a control group of 50 patients who were conventionally treated. The control group underwent 36 superficial and 21 subtotal/total parotidectomies in the same surgical manner but without the use of the diathermy scissors. Cases involving revision surgery and preparation of the facial nerve in skin malignancies were excluded. The indications for surgery were almost the same in both groups. The follow-up time was the same (12 months).

All operations were performed by the same surgeon, with the patients under general anesthesia and normal conditions of blood pressure (110-130 mm Hg systolic). The statistical significance of cut-closure time differences was calculated by normality (Kolmogorov-Smirnov) and t tests.

### RESULTS

Diathermy scissors are very well suited for most of the surgical steps in parotid gland surgery. However, some practice is needed for proper use of this tool. Both arterial and venous bleeders are safely coagulated, resulting in a major reduction of intraoperative bleeding. Coagulation of arterial and venous vessels with a diameter of 2 to 3 mm can ideally be performed before cutting, with the tips of the scissors slightly open. This step, in turn, reduces the frequency with which instruments need to be changed. Simultaneous cutting and coagulation also reduces intraoperative bleeding. Therefore, the use of the diathermy scissors improves the view in the surgical field, especially visualization of the facial nerve branches (Figure 1 and Figure 2).

### COMPLICATIONS

There was no evidence of postoperative bleeding, hemorrhage, or seroma. In 1 case, after superficial parotidectomy for pleomorphic adenoma, a salivary fistula was present for 3 weeks. Within the 12-month follow-up period, we did not observe any cases of Frey syndrome. Transient facial nerve paralysis occurred in 3 of 37 cases: 2 cases with isolated inferior trunk weakness and 1 case with a complete peripheral facial paresis. All 3 cases completely resolved by 6 months after surgery. The quality of facial nerve monitoring was not impaired by diathermy scissors. Muscle contractions were sometimes observed with the use of the diathermy scissors, similar to electrocautery.

### CUT-CLOSURE TIME

During superficial parotidectomy procedures (n = 23), the cut-closure time ranged from 50 to 120 minutes, with an average of 87.6 minutes (Figure 3). During subtotal and total parotidectomy procedures (n = 10), it ranged from 80 to 160 minutes, with an average of 130.0 minutes (Figure 4). In comparison, in the control group these figures were 60 to 140 minutes (average, 103.6 minutes) for superficial parotidectomy and 80 to 230 min-
utes (average, 149.3 minutes) for subtotal and total parotidectomy (Figures 3 and 4). Therefore, with the use of diathermy scissors, we saw a statistically significant average time gain of 16.0 minutes (15.4%) (P = .03) during superficial parotidectomy procedures. During subtotal and total parotidectomy procedures, the average time gain was 19.3 minutes (12.9%); it was not statistically significant, however, because of the small number of operations.

With the development of and advances in new and alternative surgical dissection techniques (eg, laser-cutting technologies, ultrasound scalpel, water-jet dissection, and others), a decision has to be made as to which one of these tools is best used for the large spectrum of surgical procedures. Additional technical support and the acquisition of new practical skills to properly use these tools are also frequently required.

In contrast, the diathermy scissors represent a simple extension of the application of dissection scissors but with additional hemostatic capability. There are numerous publications concerning the application of diathermy and bipolar scissors in different surgical procedures (eg, colectomy, circumcision, laparoscopic cholecystectomy, vaginal and abdominal hysterectomy, and elevation of the radial forearm fasciocutaneous free flap). Baggish and Tucker conclude that bipolar scissors provide significant safety advantages and performance that is equal to or better than monopolar scissors when used for laparoscopic surgery. In head and neck surgery, bipolar scissors have already been used for (pediatric) adenoidectomy, tonsillectomy, punctate diathermy of the soft palate in the surgical treatment of snoring, reduction of the nasal turbinates, and excision of thyroid cancer; they have also proved useful in facial plastic surgery. Wax et al compared scalpel and bipolar scissors in the elevation of radial forearm fasciocutaneous free flaps. They found that the total mean time of flap elevation and blood loss were reduced significantly in the bipolar scissors group, whereas the complications were equivalent. To our knowledge, the present study is the first one to evaluate the use of diathermy scissors in parotid gland surgery.

The facial nerve is more likely to be injured during parotidectomy than during any other procedure in head and neck surgery, with far-reaching functional and cosmetic consequences. It is the complex topography of parotid gland disease, with tumors often neighboring the facial nerve, as well as the anatomy of the nerve itself, with its sometimes extremely thin branches, that contributes to the risk of injury during surgery. At the same time, the well-perfused gland parenchyma makes surgical dissection difficult. Depending on these factors, and on the surgeon’s experience, significant differences may occur in regard to the required surgical time as well as to postoperative complications. Judging from our experience, the diathermy scissors offer substantial support for the surgeon in parotid gland surgery.

The use of diathermy scissors in parotid gland surgery not only will reduce the previously frequent need to change dissecting and coagulating instruments, it also will result in a very elegant, safe, and fast surgical procedure, especially in the hands of an experienced surgeon. With proper application, the scissors can facilitate dissection, reduce intraoperative bleeding, and therefore improve visualization of the surgical field.

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