Intraoperative measurement of endotracheal tube cuff pressure and its change during surgery in correlation with recurrent laryngeal nerve palsies, hoarseness and dysphagia after anterior cervical discectomy and fusion: a prospective randomized controlled trial

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Introduction & Background

Recurrent laryngeal nerve palsy (RLNP) with subsequent vocal cord paralysis is a relatively common postoperative complication after anterior cervical spine surgery (ACDF) with an incidence of 0.6 up to 13.3 %. Besides RLNP, dysphagia or hoarseness, can occur after the ACDF. According to the meta-analysis of Shriver et al., the total incidence of dysphagia after ACDF is 8.5 %, of which 0.9 % is transient and 7.6 % permanent. Hoarseness occurs in up to 8 % of cases.
Adjustment of endotracheal tube cuff pressure (ETCP) in anterior cervical discectomy and fusion may influence the incidence of complications such as recurrent laryngeal nerve palsy, hoarseness, dysphagia.

Shriver MF, Lewis DJ, Kshettry VR et al. Dysphagia Rates after Anterior Cervical Diskectomy and Fusion: A Systematic Review and Meta-Analysis. Global Spine Journal 2017; 7: 95-103 DOI: 10.1055/s-0036-1583944

Materials and Methods

The prospective randomized controlled trial was designed to investigate the influence of ETCP on the incidence of postoperative complications. All eligible patients underwent vocal cord examination before and after ACFD, were randomized into a control (CG) and intervention group (IG). ECTP was passively monitored in CG, in IG it was maintained at 20 mmHg.
The incidence of complications was checked 24 hours after surgery, on the day of discharge and during throughout the follow-up period via the outpatient clinic at 6 weeks, 3 month and 6 months intervals. In cases where laryngoscopy revealed postoperative RLNP, two follow-up examinations were planned, one week after the initial laryngoscopy and shortly before each patient's first check-up in the outpatient clinic.

Results

A total of 98 patients were randomized, each group consisted of 49 patients. Statistical analysis showed that gender and age did not influence the incidence of complications. In CG duration of retractor placement and extent of approach significantly impacted the occurrence of complications. Incidence of postoperative RLNP was 8.2% in IG, 12.2% in CG, hoarseness and dysphonia were present in 18.4% in IG and in 37.5% in CG, dysphagia in 20.8% in IG and in 22.5% in CG. Hoarseness was significantly more present in CG (ρ=0.018). Only one patient from CG presented with RLNP after 1 year, the remaining nine patients experienced spontaneous recovery of the RLNP.

Table 1 - Incidence of complications

Complications	Control group	Intervention group	ρ value
RLNP, % (n)	12,2 (6)	8,2 (4)	ρ=0.25
Hoarseness, % (n)	37,5 (18)	18,4 (9)	ρ=0.02
Dysphagia, % (n)	22,5 (11)	20,8 (10)	ρ=0.42

RLNP; recurrent laryngeal nerve palsy

boldfaced ρ values denote statistical significance

Conclusion/discussion

Unregulated ETCP can lead to a significantly higher incidence of hoarseness, however the postoperative improvement was 100%. The early postoperative complication rate was higher in CG and after a one year 1 patient had RLNP, and one patient had dysphagia.

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