

## THORACIC EPIDURAL ANALGESIA INHIBITS DETRUSOR CONTRACTILITY IN FEMALES RESULTING IN CLINICALLY RELEVANT POST VOID RESIDUALS

### Hypothesis / aims of study

The need for an indwelling transurethral catheter in patients with postoperative thoracic epidural analgesia (TEA) is a matter of controversy. Subjective observations are ambivalent and the literature addressing this issue is scarce. As segmental blockade can be achieved with epidural analgesia the assumption would be that analgesia within segments T4 to T11 should have no or minimal influence on urinary tract function. Here we urodynamically assessed the influence of TEA on lower urinary tract function in women with TEA.

### Study design, materials and methods

A prospective, open, observational, follow up study Primary outcome was the difference in post-void residual urine before and during TEA. Based on our hypothesis, a sample of 13 patients was needed to exclude differences in post-void residual of 100 ml at a two sided significance level of 5% with a statistical power of 90% and a standard deviation of +/- 100ml (NCSS PASS programme, NCSS, Kaysville, UT). Statistical analyses were performed with the Wilcoxon signed rank test and P value < 0.05 was considered significant. SPSS 15.0 (SPSS Inc., Chicago, IL) was used for statistical analyses.

We investigated lower urinary tract function in 13 female patients with no preoperative lower urinary tract symptoms by urodynamic investigations the day before and 2-3 days after open kidney surgery by lumbotomy with the patients under TEA. All patients received a TEA placed at the insertion site interspace T 7-8 or T 8-9.

### Results

TEA resulted in a significant increase in post-void residual (225 ml (30-350) vs. 5ml (0-95),  $P<0.001$ ) (Figure 1). Maximum detrusor pressure, detrusor pressure at maximum flow rate and maximum flow rate were significantly reduced under TEA (5 cmH<sub>2</sub>O (5-44) vs. 24 (12-77),  $P=0.005$ ), (5 cmH<sub>2</sub>O (5-34) vs. 19 (8-38),  $P=0.001$ ) and (3 ml/s (0-11) vs. 12 ml/s (6-23),  $P<0.001$ ), respectively. Maximum urethral closing pressure at rest was significantly reduced under TEA (53 cmH<sub>2</sub>O (24-105) vs. 74 (33-115),  $P=0.005$ ). Bladder capacity, bladder sensation and functional urethral profile length at rest were not influenced by TEA. Interestingly detrusor overactivity, which was observed in 3 women without TEA disappeared during TEA.

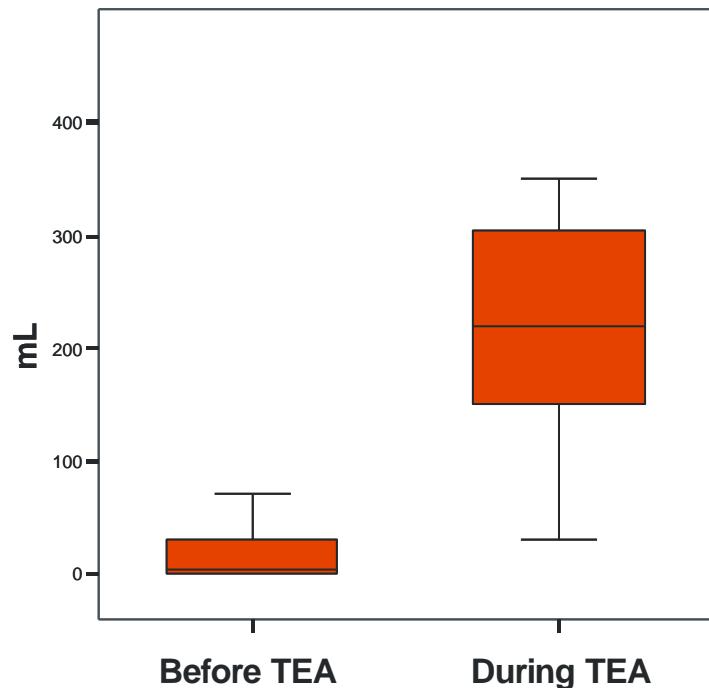
### Interpretation of results

TEA as applied in this study has an impact on detrusor function resulting in clinically relevant post-void residuals.

### Concluding message

Patients under TEA may develop significant postvoid residuals necessitating monitoring after catheter removal. It may also have a positive effect in women with detrusor overactivity. Further studies are needed to investigate the exact mechanism of action.

**Table 1:** Box plot illustrating post-void residual urine volume before and during TEA ( $P<0.001$ ):



<i>Specify source of funding or grant</i>	Schweiz. Gesellschaft für Anästhesie und Reanimation SGAR
<i>Is this a clinical trial?</i>	Yes
<i>Is this study registered in a public clinical trials registry?</i>	Yes
<i>Specify Name of Public Registry, Registration Number</i>	Clinicaltrials.gov, nct 00790231
<i>Is this a Randomised Controlled Trial (RCT)?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Kant. Ethikkommission Bern
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes