

Efficacy of thoracic paravertebral nerve block for patients who undergo video-assisted thoracoscopic surgery - randomised controlled trial-

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# [Introduction]

•There were a few reports which investigated the analgesic efficacy and the safety for the thoracic paravertebral nerve block (TPVB) for the thoracic surgery.

•We investigated the analgesic efficacy of the TPVB in videoassisted thorascoscopic surgery compared with the thoracic epidural analgesia.

# [Material and Method]

Study type: A prospective study divided into E and T groups Condition: video-assisted thorascoscopic surgery

Study period: From July 2013 to July 2014

Excluded cases: cases having corrective secondary surgery, an allergic reaction to levobupivacaine, and cases having severe heart, renal or liver dysfunction

E group: general anesthesia and continuous epidural anesthesia block

T group: general anesthesia and continuous TPVB

# [Flow chart]

TPVB or Epi

Each catheter was inserted into paravertebral or epidural space between the  $5^{th}$  and  $6^{th}$  rib, or the  $6^{th}$  and  $7^{th}$  at the back

#### General Anesthesia

# [Result]

<Patient characteristic>

	E group (n=40)	T group (n=40) 69 (54-83)	
Age (years)	65 (24-79)		
BMI (kg/m²)	<b>2</b> 3.0 (13.5-37.0)	22.0 (19.2-31.6)	
ASA classification (I/II)	5/35	3/37	
Anesthesia time (min)	257.5 (185-365)	202.5 (125-305)	
Operation time (min)	207 (150-340)	150 (105-255)	
An amount of fentanyl in perioperative period (µg)	400 (100-900)	400 (100-800)	
An amount of remifentanil in perioperative period (mg)	1.91 (0.2-4.27)	1.68 (0.1-5.46)	





### 〈Pain Scores〉

rest	E	т	P-value	move	E	т	P-value
1	0 (0-4)	2 (0-3.25)	0.68	1	0 (0-4)	3 (0-3)	0.13
2	0 (0-4)	3 (0-4)	<0.05	2	0 (0-4)	3 (0-5)	<0.05
4	0 (0-1)	3 (0-4)	<0.05	4	0 (0-4)	3 (0-3.25)	<0.05
6	0 (0-2.25)	3 (0-3)	<0.05	6	3 (0-3)	3 (0-3.25)	0.35
12	1 (1-3)	3 (0-3)	<0.05	12	3 (0-5)	3 (0-4)	0.68
18	1 (1-3)	3 (0-4)	<0.05	18	3 (0-5)	3 (0-5)	0.27
24	1 (1-2)	3 (0-3)	<0.05	24	4 (0-5)	4 (0-5)	0.37

Numerical rating scale (NRS) pain score during the first 24 hours after surgery Data expressed as median (interquartile)(times).

Anesthesia was maintained with total intravenous anesthesia (propofol and remifentanil). Rocuronium was administered at the discretion of the anesthetists. Additional 50-100 µg fentanyl boluses were administered to maintain blood pressure or heart rate value sings obtained when the patient entered the operation room

#### At the closed chest

20 mL of 0.375 % levobupivacaine was injected from the catheter inserted into the paravertebral or epidural space. Then the catheter was attached to a CADD<sup>R</sup>-Solis PIBs (CADD, Smith Medical Japan Ltd., Tokyo, CADD), which are patient-controlled analgesia devices. The set flow rate of CADD was with a continuous infusion of 6 mL levobupivacaine (0.125%) every hour.

At the end of the surgery, fentanyl 2 µg kg-1 was infused intravenously. The CADD, in the Program Intermittent Bolus delivery mode was used to deliver 20 µg of fentanyl intravenously outside of a10 minutes interval for 2 days.

The primary outcome measured was the number of injected fentanyl boluses during the first 24 hours after surgery.
The secondary outcome measured was the number of required additional fentanyl doses. A numerical rating scale (NRS) was used to determine a pain score during the first 24 hours after surgery.

### [Discussion]

The TPVB is as effective as the epidural analgesia in videoassisted thoracoscopic surgery.

The spread of local anesthetic for TPVB is almost the same as epidural anesthesia. Considering that epidural anesthesia is a landmark technique, ultrasound guided-TPVB may be safer than the epidural analgesia in video-assisted thoracoscopic surgery.

### [Conclusion]

The number of injected fentanyl bolus to the T group was equal to the E group.

The TPVB is as effective as the epidural analgesia in videoassisted thoracoscopic surgery.

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