A Comparison of the Success Rate between Epidural Block and Peripheral Nerve Block in Foot Surgery

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◎ Background and Aims

- Epidural block and peripheral nerve block are both effective in perioperative analgesia for foot surgery.
- The aim of this study was to compare the incidence of unsuccessful block between epidural block and peripheral nerve block (PNB).

◎ Methods

- The clinical outcomes of two anaesthetic techniques (GA+PNB: PNB-Group and GA+epidural block: Epi-Group) for postoperative analgesia after foot surgery in patients with rheumatoid arthritis between 2014 and 2017 were retrospectively reviewed.
- Anaesthesia was conducted at anaesthesiologist's discretion. PNB included a single-shot sciatic, a combined saphenous-sciatic, and a femoral-sciatic nerve block. For postoperative pain, supplemental analgesics were used when patients requested.
- "Unsuccessful block" was defined with the following criteria:
 - 1) A technical failure case.
 - 2) A case with additional analgesics required just after arousal from general anesthesia.
 - 3) A case with rescue analgesic requested within the first 5 postoperative hours.
- Time to the first rescue analgesic after surgery and the incidence of unsuccessful block were compared between two groups.
- Survival analysis of patients without any supplemental analgesics after surgery were performed according to the Kaplan-Meier method, and the rate of unsuccessful block was calculated.

◎ Results

- Median time to the first rescue analgesic was 1681 minutes in Epi-Group and 1610 minutes in PNB-Group ($p=0.53$)(Fig.1).
- The incidence of unsuccessful block in Epi-Group was 36.4%, and 10.8% in PNB-Group ($p=0.021$)(Fig.2). Epi-Group patients more frequently developed postoperative early pain than PNB-Group.

Patient Demography	PNB-Group (N=37)	Epi-Group (N=33)	p-value
age	64±9	61±11	0.21
sex m/f	2/35	2/33	
Height (cm)	154±6	155±7	0.53
Weight (kg)	52±10	51±9	0.89
Procedure time (min)	115±48	111±35	0.86
Anesthesia time (min)	174±51	164±37	0.51
Fluid infusion (mL)	1078±282	1029±325	0.51
Blood loss (mL)	6±14	6±8	0.93

◎ Discussion

- Ultrasound-guided PNB technique provides a higher success rate than epidural block.
- PNB failure was more frequent in the absence of saphenous nerve block in the procedure with medial side of the forefoot. Tailor-made PNB strategy is required for achieving higher success rate.
- The percentage of rescue analgesics free patients is higher in Epi-Group after 24 hours from the surgery, which we infer is because of the difference of duration between one-shot local analgesics and continuous epidural analgesia.
- Fig 1 shows the biphasic pain rescue requirement in Epi-Group. In many cases, epidural analgesia was discontinued in the morning of the 1st POD (median 1249 [1121-1377] min). The balance of rehabilitation program feasibility and pain reduction is an important issue.

◎ Limitation

- The sample size is small.
- Clinical heterogeneities might be involved in this study (e.g. the wide variation in the surgical site, local anaesthetics, and different approaches).

◎ Conclusion

The incidence of unsuccessful block for foot surgery was lower in PNB than in epidural block.

Fig.1 Kaplan-Meier curves of percentage of patients without any supplemental analgesics after surgery in Epi-Group and PNB-Group

Fig.2 The rate of unsuccessful block in Epi-Group and PNB-Group