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Why epidural blood patch in postdural pain headache

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Abstract

Objective: Spinal anesthesia has some complications such as intravascular injections, nerve injuries, hypotension, bradycardia and dural ruptures. When puncture is performed on dura or araknoid, there is a risk of post-dural-puncture headache.

Material and Methods: 16003 patients, who were operated at the Erzincan State Hospital and Erzincan Mengücek Gazi Education and Research Hospital between 2004 and 2011 were involved in this study. Epidural blood patch was applied on 159 patients complaining of post-dural-puncture headaches. 15 ml of the autologous blood was given to the epidural region in the surgery room for patients which had epidural blood patch applied. Epidural blood patch was applied 2 days after the dural injury

Results: 72 females and 67 males were involved in the study. Symptoms of post-dural-puncture headache disappeared within minutes immediately after the process. After the first application of epidural blood patch, 156 patients felt relaxed. 3 patients had a relief after the first application, but their symptoms relapsed, and a second injection was performed 24 hours after the first one. Following the second epidural blood patch, none of the patients reported any headaches. No complications emerged during the procedure in the patients. The patients were discharged 2-3 hours after the epidural blood patch application.

Discussion: Epidural blood patch is a treatment method with lower risks of complications, lower costs and high success rate for post-dural-puncture headache patients. It is advised especially after the C-section, for preserving mother-baby communication.

Key words: Blood Patch; Epidural; Postdural; Pain; headache; Anesthesia, Spinal

Introduction

Spinal anesthesia has some potential advantages over general anesthesia and it has been widely and successfully used for nearly 100 years, especially in surgeries of lower abdomen, perineum and lower extremities (1). Some major advantages of regional anesthesia are the continuation of patient's spontaneous respiration, preservation of oropharyngeal reflexes, postoperative analgesia and shorter length of hospitalisation (2,3). With new local anesthetic drugs and spinal needles introduced, complications are minimized and more professionals prefer this method (4).

Spinal anesthesia is an alternative to general anesthesia in most cases. It can be used simultaneously with general anesthesia, or postoperative for analgesia, acute and chronic pain treatment. Today, most of the C-sections attempts are also carried out with the epidural or spinal anesthesia (5). It was shown that with an appropriate approach, neuroaxial anesthesia methodologies are highly safe, but there can be some complications emerging during and after the procedure. Some of these complications are intravascular injections, nerve injuries, hypotension, bradycardia and dural rupture (6,7). When puncture is performed on dura or araknoid, there is a risk of Post-dural-puncture headache (PDPH). Post-dural-puncture headache is the most common complication of the regional block anesthesia and it is an important condition caused by the leakage of the cerebral spinal fluid (CSF) from the hole opened by the needle during dura puncture and related to CSF pressure(8).

The international headache society defines PDPH as a bilateral headache developing within 7 days after the lumbar puncture and disappearing in 14 days (9), while Vandam and Dripps (10) defines it as pain which can affect both sides of the neck and shoulders even though it is generally in frontal and occipital regions.

The aim of this study is to share our clinical experiences on Epidural patch as a treatment procedure in patients with PDPH

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Material and Methods

This retrospective study has been approved by ethical committee of the Erzincan University, Faculty of Medicine. 16003 patients, who were operated in the Erzincan State Hospital and Erzincan Mengücek Gazi Education and Research Hospital between 2004 and 2011 were involved in this study. Patients complaining from PDPH had nausea and back/neck pain as well as headaches. These symptoms were increasing, especially when the patients were standing. Epidural Blood Patch (EBP) was applied on 159 patients' suffering from PDPH. Spinal anesthesia was applied on 72 of these patients, while combined regional anesthesia was applied on 87 of them. Patients were aged between 19 and 74. Patients were involved in the study after operations in inguinal hernia, C-section, anal region diseases and urological and lower extremity orthopaedics. Patient Demographic Features are given in Table 1.

The epidural patch was applied in the surgery room to all patients. After taken to the surgery room, the patients were monitored, veins were opened with 18 G branule from antecubital fossa and 500 ml crystalloid was given. When the patients were in a sitting position, skin was sterilized with povidone iodine. After local anesthesia, process was started in L4-5 range, with loss of resistance method, using 18G Tuohy needle normal saline (N/S). Subarachnoid range was entered 4.5 cm away from skin. When the injector leaves the epidural needle, CSF flow was seen, and it was confirmed as CSF with flow rate and temperature after that, epidural needle was pulled until CSF flow stopped and the pulled distance was confirmed as epidural range with N/S injection aspiration method. Patient's antecubital zone was sterile cleaned with povidone iodine. 20 ml autologous blood was taken with a 20 ml IV injector and 15 ml blood was given to the epidural range from epidural range Tuohy needle.

Success of EBP was measured as total relief (disappearing of all symptoms), partial relief (being able to clinically perform daily activities) or failure (persistence of serious symptoms).

Results

72 females and 67 males have been involved in the study. Surgeries and anesthesia's of the patients are given in Table 2.

27 G Quinke spinal needle was used on all 87 patients spidural. Anesthesia was performed while for spinal anesthesia, 25 G Quinke was used for 30 patients, 27 G Quinke was used for 25 patients, 29 G Quinke was used for 10 patients and 22 G Quinke was used for 7 patients, All patients were discharged 24 hours after the procedure.

According to the patients' records, EBP was applied to 159 patients with VAS scores between 7 and 9. Patients with VAS scores 4-5 were conservatively followed (iv liquid replacement, 3000 ml paracetamol-cafein combination or analgesic treatment with NSAI drugs). 15 ml autologous blood was given to epidural region in the surgery room and to the patients, EBP was applied. EBP was applied 2 days after the dural injury. Symptoms of PDPH disappeared within minutes immediately after the process. After the first application of EBP, 156 patients felt relaxed. 3 patients had a relief after the first application, but their symptoms relapsed, and a second injection was performed 24 hours after the first one. Following the second EBP, all complaints of these patients disappeared. No complications emerged in the patients. Patients were discharged 2-3 hours after EBP application.

Table 1: Patient Demographic Features

	COMBINED (spidural)	**SPINAL**
C-section	4105	2198
Lower abdomen surgery(ing. herni, Umb. Her. P.sinüs- hemoroid)	3178	1538
Orthopedics(meniscopathy)	2201	1642
Urological cases (BPH-Ureter stone- varicosele)	3424	923
Gynecologic cases (histerektomi)	489	410
TOTAL	9292	6711

Table 2: The surgeries of post-dural puncture headache

	COMBINED (Spidural)	SPINAL	Age Ratio
Section	47	28	27
Lower abdomen surgery	13	14	32
Orthopaedics	9	16	31
Urological cases	14	9	33
Gynaecologic cases	2	4	41
Total	85	71	29

Discussion

Even though spinal anesthesia is the most common regional anesthesia methodology, most of the clinicians and physicians had negative feeling towards it and were aversive due to the risks of infection, spinal neurotoxicity, post-spinal headaches and life-threating complications (11). PDPH, caused by leakage of CSF from the hole in dura opened by the needle used in spinal anesthesia and related to CSF pressure, has many negative consequences and it is a serious condition. The most important factor in its emergence is considered as needle type and thickness (12). PDPH incident varies between 0% and 37% depending on needle type and size (13). As the diameter of the needle increases, risk of the headache occurring also increases (14).

There are many studies showing that pen-edged and small-diameter needles can decrease the PDPH indicence (15). Research on durameters with electron microscopy has shown that pen-edged needles causes more damages with respect to sharp-edged needles. Pen-edged needles are also causing irregular rupture and following inflammatory reaction, and less CSF leakage with respect to the sharp-edged needles cutting in U shape (16). Westbrook et. al. (17) shown that pen-edged needles cause less CSF loss and this is revelant with the needle design

Different studies show that the PDPH incidence is 40% with 22 gauge needle, 25% with 25 gauge needle (18,19), 2-12% with 29 gauge needle and 2% with 29 gauge needle (20,21). Jeanjean et. al. found PDPH incidence as 0.08% in their study with 24 gauge needle (22) and Despond et. al. found incidence as 9.3% with 27 gauge needle (23) and Frenkel et. al, found incidence as 3.5% with 25 gauge needle (24). In our study, PDPH was observed in 5.8% of our patients. PDPH incidence was 5.8% with 22 gauge quincke neede, 10.1% with 25 gauge quincke neede, 5.1% with 27 gauge quincke neede and 1.9% with 29.

We believe that success of epidural patch is directly related to the proximity of blood to the injection puncture region. Injection in the same space is advised, even though not necessary.

If the same spot cannot be used for any reason, using the space below is advised because there is a possibility of blood diffusion in epidural space. Thus, when there is more than one puncture, the lowest puncture region should be used for puncture region injection (25).

Hypotension and bradycardia are common side effects of spinal anesthesia, these situations are easily overcomed by the anesthetist so these side effects do not create a burden and distress in the patient for a long time. However, severe headaches which have been observed in 12-24 hours postoperatively due to dural injuries, can seriously affect patients' comfort as well as mobilization.

Epidural blood patch to treat postdural headaches is known as the gold standard in the literature. Because the epidural blood patch is an invasive method and causing a second dural injury, this method does not seen much interest to the anesthesiologists. Although the continued headache, conservative treatment is continued to postoperative 48 hours.(26). In our experience, conservative treatment did not shorten the duration of the postdural headache and this time were approximately 7 to 10 days longer. When applied by an experienced anesthesiologist, epidural blood patch is reduced to a minimal complications ratio; and it has been found to provide a radical improvement in a very short time in the treatment of postdural headache.

Hospitalization might be necessary for monitoring patients in case of headaches related to cerebrospinal fluid leakage after C-section. This might cause early dissociation of mother and baby (27). EBP can be used to prevent cerebrospinal leakage and preserve mother-baby bond.

Conclusion

EBP is a treatment methodology with lower risk of complications, lower costs and high success rate for PDPH patients. It is advised especially after C-section, for preserving mother-baby communication.

Conflict of Interest: The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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