Selective Spinal Anesthesia: Unilateral and Posterior Techniques

An essay

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا
عَلَّمْتَنَا
إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

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List of Abbreviations

AAG	Alpha-1-Acid Glycoprotein
ASA	American Society of Anesthesiologists
ASRA	American Society of Regional Anesthesia and Pain Medicine
C1	Cervical Vertebra 1st
COX	Cyclooxygenase
CSF	Cerebrospinal fluid
CT	Computed tomography
G	Gauge
GA	General Anesthesia
GABA	Gamma-Amino butyric acid
Hr	Hour
L2	Lumber Vertebra 2nd
LA	Local Anesthetic
LDS	Low-Dose Spinal
LMWH	Low-Molecular-Weight Heparin

MAP	Mean arterial pressure
mcg	Microgram
Min	Minute
ml	Milli-liter
MRI	Magnetic Resonance Imaging
NMDA	N-methyl-D-aspartate
NSAIDS	Nonsteroidal Anti-Inflammatory Drugs
O2	Oxygen
PaCO2	Partial pressure of carbon dioxide
PaO2	Partial pressure of oxygen
PDPH	Post Dural Puncture Headache
PPT	Partial thromboplastin time
RA	Regional Anesthesia
S2	Sacral Vertebra 2nd
SSA	Selective Spinal Anesthesia
SVR	Systemic Vascular Resistance
T1	Thoracic Vertebra 1st
TNS	Transient Neurological Symptoms

TURP	Transurethral Resection of Prostate
UK	United Kingdom

INTRODUCTION

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Spinal anesthesia is a common type of regional anesthesia, which is done by injecting small amounts of local anesthetic into the subarachnoid space to produce a reversible loss of sensation and motor function. Injection of that local anesthetic into this zone can lead to dramatic hemodynamic changes if handled incorrectly. If it were possible to limit anesthesia for the surgical field certain undesirable effects of spinal anesthesia could be avoided ***(Erhan et al., 2003).***

The first anesthesiologist to try limiting spinal anesthesia blockage was Jonnesco in 1909 and he called his modifications ‘‘Segmental spinal anesthesia’’, attempting to restrict the extent of sensory, motor and sympathetic bloackage to the surgical zone ***(Jonnesco, 1909).***

Among selective spinal anesthesia techniques are fractional segmental spinal analgesia, where limiting of the block is achieved by intermittent injection of low doses of agents into the subarachnoid space via an indwelling catheter or directly through a needle ***(Hocking and Wildsmith, 2004).***

If the patient undertook spinal anesthesia in the sitting position perineal area anesthesia is achieved, this technique is

known as ‘‘Saddle block’’, in which a hyperbaric solution is injected to the subarachnoid space with the patient in that position. The solution gravitates towards the lower region. The use of hypobaric solution for perineal anesthesia does not change the final effect of the local anesthetics in the CSF, but it can affect the distribution of them within the subarachnoid space when the patient is placed in the jackknife position, and, in this case, changes the distribution of the spinal block. ***(Imbelloni et al., 2010).***

Unilateral spinal analgesia, where anesthesia is restricted to only one side of the body by the intrathecal injection of hypobaric or hyperbaric solutions while the patient is instructed to lie down in lateral position. In practice, the conventional unilateral spinal anesthesia technique results in both sensory and motor hemi‑block and; a practical definition of spinal hemi anesthesia as Higuchi mentioned is ‘‘The attempt of achieving an asymmetrical distribution of spinal block between the operated and nonoperated sides of the patients’’ ***(Higuchi et al., 2005).***

AIM OF THE WORK