

### Ultrasound guided lower extremities regional anaesthesia.

Rostyslav V Bubnov, MD

The Center ultrasound diagnostics and interventional sonography

Clinical hospital "Pheophania" of State Affairs Department, Kyiv, Ukraine

03680, Kyiv, Zabolotny ave., 21

e-mail: [rostyslavbubnov@mail.ru](mailto:rostyslavbubnov@mail.ru), <http://www.rostbubnov.narod.ru/>

**Background.** Today sonographic guidance is considered to be a "gold standard" of modern regional anesthesia. Since 2008, in the hospital "Pheophania" full the entire spectrum of modern blocks of various locations is implemented. The criteria of sonographic visualization of nerves and some techniques of regional anesthesia were established. The aim of this work was to study fundamental sonographic parameters of nerve and needles, as well as some methodological aspects of regional anesthesia during ultrasound under control.

**Materials and methods.** According to the goal in the study group included 84 patients who underwent lower extremities surgery under ultrasound guided regional anesthesia. In 55 patients perineural catheter was introduced to the follow continuous anesthesia. Examination was performed using a portable ultrasound device Sonosite M-Turbo with multifrequency convex and linear transducers. The special needles for regional anesthesia Contiplex type A, D set length of 50 mm were used. As a local anesthetic 0.5% solution of Bupivacaine was injected. In some cases the nerve stimulator was used as a nerve identification tool (2 Hz frequency, 100 µsec 1.0 mA (the motor response to 0,4 mA was considered as sufficient). We evaluated the effectiveness of anesthesia b 100 point Visual Analogue Scale (VAS) immediately postoperatively and again 24 h postoperatively.

**Results.** The high efficiency (more than 90 points) was registered during sciatic block in 36 patients (92%), during femoral block - in 33 patients (89%), during n.saphenus block - in 8 patients (100%). While performing all ultrasound guided blocks returned positive symptom anesthetic spread around the nerve ("bagel sign"). All blocks were conducted analgetic effect enough for surgery.

**Table. Results of lower extremity ultrasound guided nerve blocks**

	Sciatic block		Femoral block		N.saphenus block	
Number of Blocks	39		37		8	
	In plane	Out of plane	In plane	Out of plane	In plane	Out of plane
90 points (effective)	21	15	11	22	8	-
80-90 (conditionally efficient) *	1 (4%)	1 (6,6%)	1 (9%)	2 (9%)	-	
60-80 (poorly) *	-	1 (6,6%)	-	1 (4,5%)	-	
Distance from the nerve, mm	37 (35-52)	28 (23-40)	22 (13-45)	16 (10-38)	23 (16-32)	-
Using the nerve stimulator	11	8 (1 conditionall y efficient)	16	8	-	-
«Single shot»	15		17		7	
Programmable anesthesia	24		20		1	

\*- Including programmable remote period of anesthesia.

Block was poorly effective in patients with complicated anatomy, with excess weight, deep bedding nerve (deeper than 40 mm), over the performance by the short axis block (Out of plane). When scanning in long axis method the greater range of successful blocks was achieved (95% at the sciatic block, 92% at femoral block) than in short axis scan (88% at the sciatic block, 89% at femoral block). When using combined ultrasound and nerve stimulator control case conditionally effective block was registered (12.5%).

Positive 'bagel sign' (the circular spread of anesthetic visualization) can not be reliable symptom of successful anesthesia in all cases. A poorly effective blocks, in our opinion, was due to introduction of anesthetic beyond "own fascial bundle" nerve due to disposal site. In all cases effective needle and catheter position correction under ultrasound control was held.

**Conclusion.** The ultrasonund is an effective method of control of the lower extremities regional anesthesia. The further study and improvement of methodological aspects are required. The «in plane» scan method could be considered as more acceptable to hold the block. Block effectiveness is not directly dependent to the additional use of nerve stimulator.

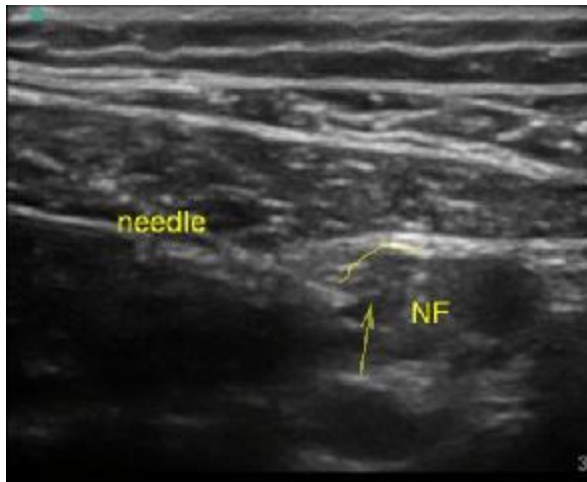


Figure 1. Femoral block in p1ane. The catheter under the "own fascicular beam" of femoral nerve. The effect of anesthesia "in needlepoint".