

Application of lattice localizer in preoperative localization for percutaneous vertebroplasty

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Abstract: To explore the value of lattice localizer in preoperative localization for the percutaneous vertebroplasty, from March to May 2011. 40 patients were divided into two teams randomly. The preoperative localization in team one was done with K-wires, another with the self-designed lattice localizer. The location times and the duration were document. Result: we have spent more times and duration on the locating with the K-wires than the lattice localizer. The difference between them was superior in statistics. We spent less time and endure less radiograph in preoperative localization with the lattice localizer than K-wires.

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Key words: spine; localization; pedicle

Introduction

Percutaneous vertebroplasty is a minimally invasive operation, used in the treatment of the osteoporosis vertebral compression fractures or vertebral tumor, with less injury, good effect^[1-3]. It has carried out more extensive in china as well as abroad. In operation, first of all, we must make vertebral pedicle fluoroscopy to locate the poin, through which we put the needle^[4]. It is generally that application of 2-3Kirschner undertakes fluoroscopy. We need to move X-ray machine several times. We design grid locators to positioned, According to the anatomic features that the distance between the pedicles to the lumbar spinous is about 1.5-2.0cm it is significantly saved the locating time and reduces the amount of positioning, but reduced radiation exposure. Report as follows now.

Design of grid locators

Grid locator is made of a thin wire; the length of it is about 20cm. Each side of the loctor is 3cm long. The loctor is divided into 9 smaller squares; each of them is 1cm long. There is a orientation which is prominent with one side missed of the square, we can determine the orientation of the fluoroscopy imagine after the perspective (Figure 1).

Application of grid locators:

First of all, we should determine the fracture vertebral and operation side, as well as the spinous process line. Then put one side of the grid locator and the spinous process in parallel, if it is necessary, we can adjust the loctor with the bake curvature. Fixed the grid locator with adhesive tape(Figure 2). Secondly, we can determine the ideal entry point by analysis the imagine of perspective easily. (Figure 3).

The traditional positioning method:

When we Identify the vertebral and

percutaneous pedicle side, then crossed 2 K- needles to locate the pedicle, after the perspective,we can adjust the two wire by the image . Until the perspective position meet our satisfaction. There are 40 patients in the test, they are divided into two teams randomly, Group A, application of the original method for positioning. Group B application grid locator for locating. Patients in group A are about 61-76 years old, average 65.5, the number of T11 fracture is 1, T12 is 12, L1 is 6 , L2 is 1. Patients in group B are 62-78 years old, average66.3, T12 fracture is14, L1 is 4, L2 is 1. L4 is 1.

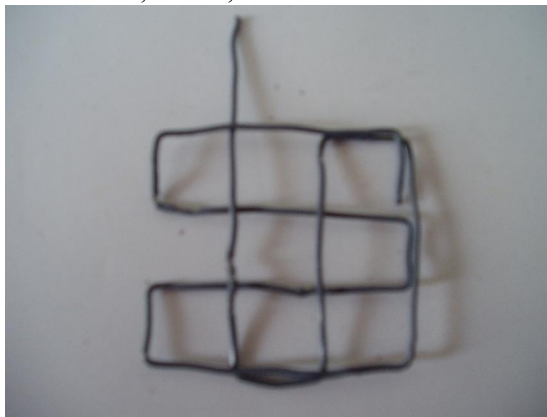


Figure 1

Inclusion criteria includes 1, single vertebral fracture; 2, unilateral vertebral puncture operation; 3, osteoporotic vertebral compression fractures.

Exclusion criteria includes 1, multiple vertebral fractures; 2 bilateral puncture. 3,no osteoporotic compression fracture. The two groups were compared. We deal with these statistics with SPSS13.0 statistic software, compare between groups, there were significant differences when $P < 0.05$.



Figure 2

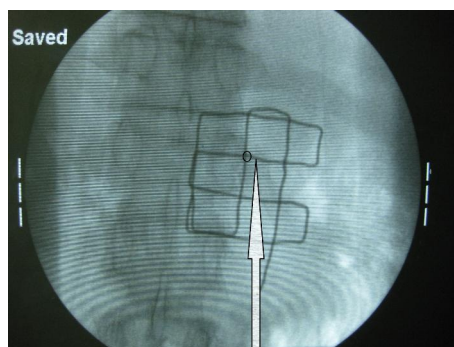


Figure 3

Point of puncture

Result

We can see the result of comparison between two groups; include the times of localization and fluoroscopy. In group B, fluoroscopy time and fluoroscopy times are significantly smaller than the group A. And the difference was statistically significant.

Table 1. The result of comparison between two groups

group	times	second
A	3.2	87
B	1	21
	P<0.05	P<0.05

Discussion

The limitations of the traditional positioning method. It is very important for the percutaneous vertebroplasty that determine the fracture vertebral and the enter point. We do the job before the operation. For it is a prerequisite for the operation. The traditional positioning method is use 2-3Kirschner needle to position, which is done after the determination of the injured vertebral pedicle. We usual use Kirschner needle only can locate fuzzy, then fluscopy, make adjustment according to the results. The times of adjust depending on the operator's proficiency. The times of exposed to radiation is also corresponding increase. It is harmful to the healthcare workers and patients.

Grid locator design features and advantages

We design the grid locator design according to the diatance, it is about 1.5-2.0cm between the pedicle and interspinous. It is equivalent to taking out 16 adjustments only once used. Can determine the goal point, we can make the optimal puncture point in the projection, for easily,eah side of the small

department is 1cm ,we can make out the ratio can mark out the smaller error location. At the same time, the positioning with the needle is poor, for without the comparable magnification.

In order to make the result accuracy, we choose these patients with a vertebral fracture, and unilateral positioning. Reject a sub-standard patient. The same doctor makes all the positons. We can see that using the grid locators can make the puncture point in one time, reduce the medical staff and the patient exposure to radiation. Shorte the operation time. At the same time,for has the designed direction, even if the location perspective display is not ideal or the vertebral which we can see on the screen is less, also won't appear direction error. And the grid locators are handmaded, with the fine wire, can be used repeatedly, does not increase the burden of the patients. Is worth popularizing.

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