Letter To Editor

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Suggested Screw Diameter for Pedicle Screwing of The Thoracic and Lumbar Vertebrae

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Spinal stability is compromised by a number of conditions, including traumatic, degenerative, tumour, infectious and malformative diseases. The treatment of instability thus induced uses several procedures, including spinal arthrodesis. When performed posteriorly, pedicle screw fixation has become the gold standard [1]. On the basis of certain data, several types of material have been used, with titanium alloys having supplanted the iron alloys previously used.

In daily practice, the choice of these implants sometimes poses a problem, especially as radiographic and CT morphometric studies of the vertebrae report variations depending on the population and geographical area [2-4]. These same studies stipulate that the lateromedian diameter (LMD), which is smaller than the craniocaudal diameter of a cross-section of the pedicle, is considered to be the determining factor in the choice of screw diameters, again according to these studies [3-5]. They also assert that a screw with a diameter equal to 70% of the LMD of the pedicles leads to fewer pedicle fractures [6], despite the fact that the latter generally increases without reducing the vertebral foramen. Taking all this data into account, we propose, in this letter, the diameters of pedicle screws that can be used in the thoracic and lumbar vertebrae.

The table 1 below shows the average LMD, expressed in millimetres (mm), of the thoracic and lumbar pedicles (Th1 to L5). These diameters were measured from CT cross-sections of the pedicles of 100 Congolese subjects, 70 men and 30 women, with an average age of 24.47 ± 3.72 years (18-30 years). These subjects were free of any traumatic, degenerative, infectious or malformative disease. These averages are for the left and right pedicles of each vertebra, and the variation was not statistically significant.

The screw diameters we propose correspond to either 70% or 50% of the average LMD. This choice will allow the use of screws with a diameter close to that of the pedicles, to enable them to better withstand biomechanical stresses, while avoiding pedicle fractures.

Thank you for your interest.

Vertèbre	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	L1	L2	L3	L4	L5
LMD (mm)	8,3	7,2	6,3	5,9	5,7	5,8	6,2	6,4	6,8	8,1	8,4	9	8,2	8,3	9,8	11,5	14,8
70% LMD (mm)	5,7	5	4,4	4,1	4	4	4,4	4,5	4,8	5,6	5,8	6,3	5,5	5,5	6,5	8	10
50% LMD (mm)	4,1	3,6	3,1	3	2,8	2,9	3,6	3,7	3,9	4	4,2	4,5	4	4	4,9	5,7	7

Table 1: Mean LMD of the pedicles of the thoracic and lumbar vertebrae expressed in millimetres (mm).

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