Thus, the present invention aims at solving all or part of the aforementioned drawbacks, by providing a transpedicular anchoring screw having a reinforced secondary stability, without degrading its primary stability.

Another objective of the invention is to provide a transpedicular anchoring screw whose implantation in a vertebra is not deleterious, that is to say is not likely to damage the bone structure of said vertebra.

Still another aim of the invention is to provide a transpedicular anchoring screw which can be implanted in a vertebra using standard tools and which remains simple to use and inexpensive to manufacture.

To this end, it provides a transpedicular anchoring screw, adapted for anchorage in a pedicle of a vertebra, including a screw body extending along a screw axis between a proximal end and a distal end, said screw body having a first thread and a second thread, each of said first thread and second thread being helical-shaped with the same screw pitch, extending between said proximal end and said distal end and having a convex-shaped outer edge,

said transpedicular anchoring screw being ~~remarkable~~ characterized in that at least said first thread has, from the proximal end towards the distal end, at least:

- a proximal portion, in which the outer edge of said first thread has a series of notched proximal portions, each defined by a proximal notch formed in said outer edge and inscribed within a notched proximal angular sector, wherein two successive notched proximal portions are separated from each other by a separation proximal portion, in which said outer edge is not notched and is inscribed within a separation proximal angular sector,

and wherein, over a length of the first thread corresponding to one screw pitch, a ratio between the sum of the measurements of all of the separation proximal angular sectors and the sum of the measurements of all of the notched proximal angular sectors is comprised between 50% and 150%; and

- a distal portion, in which the outer edge of said first thread has a series of notched distal portions, each defined by a distal notch formed in said outer edge and inscribed within a notched distal angular sector, wherein two successive notched distal portions are separated by a separation distal portion, in which said outer edge is not notched and is inscribed within a separation distal angular sector,

and wherein, over a length of the first thread corresponding to one screw pitch, a ratio between the sum of the measurements of all of the separation distal angular sectors and the sum of the measurements of all of the notched distal angular sectors is comprised between 0% and 10%.

Thus, the invention provides a transpedicular anchoring screw with a double helical thread, the geometry of one of its two threads being specially adapted to improve the

CLAIMS

1. A transpedicular anchoring screw (1), adapted for anchorage in a pedicle (P) of a vertebra (V), including a screw body (11) extending along a screw axis (111) between a proximal end (112) and a distal end (113), said screw body (11) having a first thread (2) and a second thread (20), each of said first thread (2) and second thread (20) being helical-shaped with a same screw pitch (PV), extending between said proximal end (112) and said distal end (113) and having a convex-shaped outer edge (21),

said transpedicular anchoring screw (1) being characterized in that at least said first thread (2) has, from the proximal end (112) towards the distal end (113), at least:

- a proximal portion (22), in which the outer edge (21) of said first thread (2) has a series of notched proximal portions (31), each defined by a proximal notch (3) formed in said outer edge (21) and inscribed within a notched proximal angular sector (33), wherein two successive notched proximal portions (31) are separated from each other by a separation proximal portion (32), in which said outer edge (21) is not notched and is inscribed within a separation proximal angular sector (34),

and wherein, over a length of the first thread (2) corresponding to one screw pitch (PV), a ratio between the sum of the measurements of all of the separation proximal angular sectors (34) and the sum of the measurements of all of the notched proximal angular sectors (33) is comprised between 50% and 150%; and

- a distal portion (23), in which the outer edge (21) of said first thread (2) has a series of notched distal portions (41), each defined by a distal notch (4) formed in said outer edge (21) and inscribed within a notched distal angular sector (43), wherein two successive notched distal portions (41) are separated by a separation distal portion (42), in which said outer edge (21) is not notched and is inscribed within a separation distal angular sector (34),

and wherein, over a length of the first thread (2) corresponding to one screw pitch (PV), a ratio between the sum of the measurements of all of the separation distal angular sectors (44) and the sum of the measurements of all of the notched distal angular sectors (43) is comprised between 0% and 10%.

2. The transpedicular anchoring screw (1) according to claim 1, wherein each proximal notch (3) has an identical shape and wherein each separation proximal portion (32) is inscribed within a respective separation proximal angular sector (34) with an identical extent, so that said proximal notches (3) are evenly spaced from each other along said first thread (2).

3. The transpedicular anchoring screw (1) according to claim 2, wherein each notched proximal portion (31) and each separation proximal portion (32) is inscribed within

a respective notched proximal angular sector ~~(33)~~ or separation proximal angular sector ~~(34)~~ with an identical measurement within 5°.

4. The transpedicular anchoring screw ~~(1)~~ according to claim 3, wherein the measurement of each of said notched proximal angular sectors ~~(33)~~ or separation proximal angular sectors ~~(34)~~ is comprised between 30° and 75°.

5. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 4, wherein at least one of the proximal notches ~~(3)~~ is delimited by a single notch edge ~~(37)~~ shaped as a concave circle arc.

6. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 5, wherein at least one of the proximal notches ~~(3)~~ is delimited by a notch edge ~~(35)~~ shaped as a convex circle arc.

7. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 6, wherein the proximal portion ~~(22)~~ and the distal portion ~~(23)~~ are contiguous, one of the separation proximal portions ~~(32)~~ of the proximal portion ~~(22)~~ being contiguous to one of the notched distal portions ~~(41)~~ of the distal portion ~~(23)~~.

8. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 7, wherein each of the separation distal portions ~~(42)~~ is inscribed within a separation distal angular sector ~~(44)~~ whose measurement is equal to 0°, so that the successive distal notches ~~(4)~~ are contiguous.

9. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 8, wherein at least one of the distal notches ~~(4)~~ is delimited by a single notch edge ~~(45)~~ shaped as a concave circle arc.

10. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 9, wherein each notched distal portion ~~(41)~~ is inscribed within a notched distal angular sector ~~(43)~~ whose measurement is comprised between 50° and 75°.

11. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 10, wherein the notched proximal portions ~~(31)~~ and the separation proximal portions ~~(32)~~ of the proximal portion ~~(22)~~ have a thickness ~~(E1)~~, measured along the screw axis ~~(111)~~, larger than a thickness ~~(E2)~~ of the notched distal portions ~~(41)~~ and of the separation distal portions ~~(42)~~ of the distal portion ~~(23)~~.

12. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 11, wherein the proximal portion ~~(22)~~ and the distal portion ~~(23)~~ of the first thread ~~(2)~~ extend

respectively, along the screw axis ~~(111)~~, over a proximal length and a distal length, said proximal length having an measurement comprised between 0.5 and 1.5 times that of said distal length.

13. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 12, wherein the screw body ~~(11)~~ has a transverse dimension ~~(D1, D2)~~, measured perpendicularly to the screw axis ~~(111)~~, whose measurement progressively decreases between the proximal end ~~(112)~~ and the distal end ~~(113)~~.

14. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 13, including a screw head ~~(12)~~ positioned on the proximal end ~~(112)~~ of the screw body ~~(11)~~, said screw head ~~(12)~~ having a collar ~~(7)~~ delimited by a convex-shaped collar edge ~~(71)~~ and having head notches ~~(72)~~ formed in said collar edge ~~(71)~~,

said collar ~~(7)~~ having a transverse dimension ~~(D3)~~, measured perpendicularly to the screw axis ~~(111)~~, larger than a transverse dimension ~~(D1, D2)~~ of the first thread ~~(2)~~, also measured perpendicularly to the screw axis ~~(111)~~.

15. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 1 to 14, wherein at least one amongst a proximal notch ~~(3)~~ and a distal notch ~~(4)~~ is at least partially filled with a bioresorbable material.

16. The transpedicular anchoring screw ~~(1)~~ according to claim 15, wherein each of the proximal notches ~~(3)~~ and each of the distal notches ~~(4)~~ is at least partially filled with the bioresorbable material.

17. The transpedicular anchoring screw ~~(1)~~ according to any one of claims 15 and 16, wherein the bioresorbable material is a polymer, for example a PLA (polyactic acid) type polymer, a PLGA (polyglycolic acid) type polymer or a PLA-PLGA type copolymer.