EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent: 27.08.2003 Bulletin 2003/35

(21) Application number: 98110653.7

(22) Date of filing: 10.06.1998

(54) A reaming tool for reaming bone canals
Eine Reibahle zum Ausräumen von Knochenkanälen
Un alésoir pour l’alésage de canaux d’os

(84) Designated Contracting States: CH DE ES FR GB IE IT LI

(30) Priority: 04.08.1997 DE 29713897 U

(43) Date of publication of application: 10.02.1999 Bulletin 1999/06

(73) Proprietor: Howmedica GmbH
D-24232 Schönkirchen (DE)

(72) Inventors:
• Mousavi, Seyed-Mehdi, Dr.
  1060 Vienna (AT)
• Vécsei, Vilmos, Prof. Dr. med.
  1080 Vienna (AT)
• Harder, Hans Erich
  24253 Probsteierhagen (DE)

(74) Representative: Patentanwälte
Hauck, Graals, Wehnert, Döring, Siemons, Schildberg
Neuer Wall 41
20354 Hamburg (DE)

(56) References cited:
EP-A- 0 253 526
DE-A- 2 542 056
US-A- 3 081 635
US-A- 5 462 130

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).
Description

[0001] The invention relates to a reaming tool for reaming bone canals according to the preamble of claim 1.

[0002] Such reaming tools are applied in tubular bones, for example with the femur for applying hip joint prosthesis or before driving in a bone nail for the femur, tibia, humerus, etc. From EP-A-0 508 710 there is known a reaming tool which consists of a drill head and an elongate shank which can be connected thereto. The drill head consists of four teeth arranged at a 90° distance with a chamfer which furthermore comprises a central through-bore. The shank which is likewise drilled through has a smaller diameter than the drill head. The central through-bore of the shank and drill head serves for accommodating a guiding wire along which the reaming tool is driven forward.

[0003] From EP-A-253 526 (The two part form is based on this document) or EP-A-0 440 371 there is further known a reaming tool which comprises a modified drill head and a shank which is formed flexibly. With the help of the flexible shank which at the same time represents a flexible shaft the drill head may also be moved along an arcuate path, which is required in many cases. For such a flexible shaft there are various known designs. They must not only be flexible but also be able to transmit a suitable torque. From the EP-A-253 526 it is also known to provide the flexible shaft with a smaller diameter than that of the drill head.

[0004] On application the chips removed away from the bone are conveyed behind the drill head into the intermediate space between the shank and the canal. With longer drillings it is therefore necessary to remove the tool from the canal from time to time in order to remove the chips. In this way the operating time is drastically increased. If the removal of the chips is not effected in time, a blockage of chips may occur with a corresponding blocking up of the drill head by which means an unallowable loading of the bone may occur, in particular by the developing heat.

[0005] It is therefore the object of the invention to provide a reaming tool for drilling bone canals with which the removal of chips is significantly improved.

[0006] This object is achieved by the features of claim 1.

[0007] With the reaming tool according to the invention the shank is at least over a part of its length spiraled in the manner of a thread. Preferably, the spiraling extends over the whole length of the shank, at least over a length such that the spiraled section is still located outside the bone when the drill head is in its furthest driven position. The spiraled shaft provides a groove in order to convey the chips away from the drill head towards the rotary drive for the reaming tool.

[0008] Although the outer diameter of the spiraled shank for obvious reasons is clearly smaller than the outer diameter of the drill head it is possible with such a flexible shank by its groove to convey a sufficiently large part of the machined chips to the outside. Under certain circumstances all temporary removal of the drill head from the drilled out canal for the purpose of chip removal is done away with, however, at least the number of such procedures is limited to a minimum.

[0009] In order to prevent damage to the canal walling one formation of the invention provides for the thread tip to be flattened or rounded.

[0010] Although it is conceivable to form the shank of metal, it may be manufactured just as well from plastic.

[0011] One embodiment from of the invention is described in more detail by way of the drawings.

Fig. 1 schematically shows a reaming tool according to the invention.

Fig. 2 shows a detail of the reaming tool according to Fig. 1.

[0012] In Fig. 1 there is illustrated a reaming tool at 10. It comprises a drill head 12 which e.g. may be formed according to EP 0 508 710 or according to WO 97/03617. A flexible shank 14 is connected to the drill head 12. The connection is not shown in detail. It may be conventional. Preferably there is provided a releasable connection, so that e.g. a drill head with a changed diameter can be connected to the shank 14. At the free end of the shank 14 there is mounted a cylindrical clamping piece 16 for connecting the shank 14 to the chuck of a rotary tool, in particular a rotary drive machine, for example an electric or pneumatic motor.

[0013] As can be recognized from the drawing the shank 14 is spiraled in a helix-shaped manner as is shown at 18. The spiraling carried out in a thread-like or corkscrew-like manner is provided with an adequately deep groove so that in spite of an outer diameter of the shank 14 which is significantly smaller than that of the outer diameter of the drill head 12, chips which are conveyed from the drill head 12 rearwards are transported rearwards by the spiraling of the shank 14 to the clamping piece 1 which lies safely outside the bone.

[0014] The shank 14 is of formed of metal or plastic and this being in a manner such that it can transmit the torque which is required for the reaming, but at the same time is flexible in order to function as a type of flexible shaft.

[0015] As becomes clear from Fig. 2 the tip of the threads is rounded or flattened as is indicated at 20. In this way on contacting or abutting the walling of the bone canal injuries are avoided.

[0016] As already previously quoted it is to be understood that the drill head 12 and the shank 14 comprise a through-bore for guiding through a guide wire which is not shown.
Claims

1. A reaming tool for reaming bone canals with a drill head which is mounted on an elongate flexible shank which has a diameter smaller than that of the drill head and which can be connected to a rotary drive motor, wherein the drill head and shank comprise a through-bore for a guiding wire, characterized in that the shank (14) at least over a part of its length is spiraled (18) in a thread-like manner and provided with a groove for the conveyance of chips from the drill head (12) towards the drive motor.

2. The reaming tool according to claim 1, characterized in that the thread tip (20) is rounded or flattened.

3. The reaming tool according to claim 1 or 2, characterized in that the shank (14) is of plastic or metal.

Patentansprüche


2. Räumwerkzeug nach Anspruch 1, dadurch gekennzeichnet, daß die Gewindespitze (20) abgeflacht oder gerundet ist.

3. Räumwerkzeug nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der Schaft (14) aus Kunststoff oder Metall geformt ist.

Revendications

1. Outil d'âléage pour aléser des canaux osseux avec une tête de forage qui est montée sur une tige souple allongée ayant un diamètre plus petit que celui de la tête de forage et qui peut être reliée à un moteur de commande rotatif, la tête de forage et la tige comprenant une perforation de part en part pour fil de guidage, caractérisé en ce que la tige (14) sur au moins une partie de sa longueur est spiralée (18) à la manière d'un filetage et munie d'une rainure pour transférer des copeaux de la tête de forage (12) vers le moteur de commande.