# 一、手术入路 Surgical Approach

## 1、前外侧入路：

患者仰卧于手术台上，患侧偏向手术台边缘，患侧臀下垫枕，切口自髂前上棘外侧2.5cm处，向下后经过股骨大转子的外侧面，直至股骨大转子基底部下5cm处止，分离臀中肌与阔筋膜张肌的间隙，将臀中肌向后牵开，阔筋膜张肌向前牵开，外旋髋关节，切断臀中肌大转子止点的前部或行大转子截骨，于髋臼上缘及前缘各置一拉钩，顺股骨颈前上面将关节囊作纵行切开，外展外旋髋关节使股骨头向前脱出。

**Anterolateral approach:**

Patient is positioned supinely on the surgical table, with the surgical side at the edge of the table and a small pillow under the butt of the affected side. The incision is from proximally about 2.5 cm lateral to the anterior superior iliac spine, curving distally and posteriorly across the lateral aspect of greater trochanter, and to a final point about 5cm distal to the trochanter tubercle. Dissect through the interval between tensor fasciae latae and gluteal medialis. Retract gluteal medialis muscle posteriorly and tensor fasciae latae anteriorly. Externally rotate the hip then, either divide the insertion of anterior part of gluteal medialis from the greater trochanter, or, perform the greater trochanter osteotomy. Put two retractors next to superior and anterior edges of acetabulum and do the arthrotomy longitudinally along the superior border of femoral neck, externally rotate and dislocate the femoral head.

## 2、外侧入路：

患者仰卧手术台上，患髋大转子置于床边，使臀部肌肉和脂肪下垂，切口起于大转子尖端上方5cm，纵行向下经过大转子顶端中心，再沿股骨干向远端延长约5cm，沿皮肤切口切开皮下脂肪和深筋膜，将阔筋膜张肌拉向前方、臀大肌拉向后方。锐性分离臀中肌在该层上的肌纤维，显露前方关节囊。T型切开关节囊，行股骨颈截骨。

**Lateral approach:**

Patient is lying supinely on surgical table, with the lateral side of affected hip at the edge of table. The incision is started from 5 cm proximal to the tip of greater trochanter, going distally through the center of greater trochanter , and 5 cm more along the femoral shaft. After incise the subcutaneous tissue and deep fascia, retract tensor fasciae latae anteriorly and gluteal maximus posteriorly, dissect the gluteal medius from this layer and expose the anterior capsule. Perform the “T” shape arthrotomy and then do the neck osteotomy.

## 3、后外侧入路：

患者侧卧位，患肢在上，可在健侧下肢的外踝和膝关节放置棉垫，在两膝关节之间放置一枕头。切口以大粗隆为中心略呈弧形，切口起自髂嵴下方，髂后上棘前方约6cm处，沿臀大肌方向斜向大转子中后部，然后弯向远侧，沿股骨干纵行向下若干厘米。切口长度可根据术者经验及手术需要调整。此切口损伤小暴露易，是目前THR最常用的手术入路。

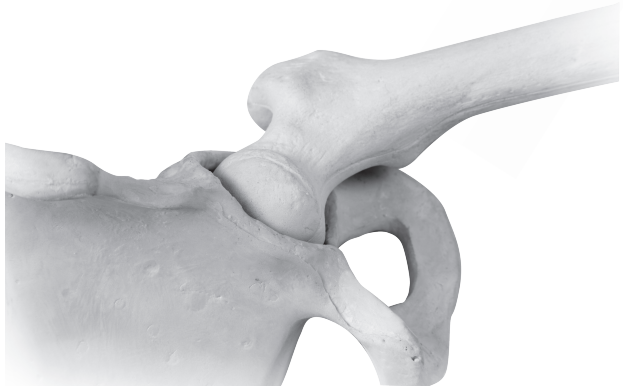
**Posterolateral approach:**

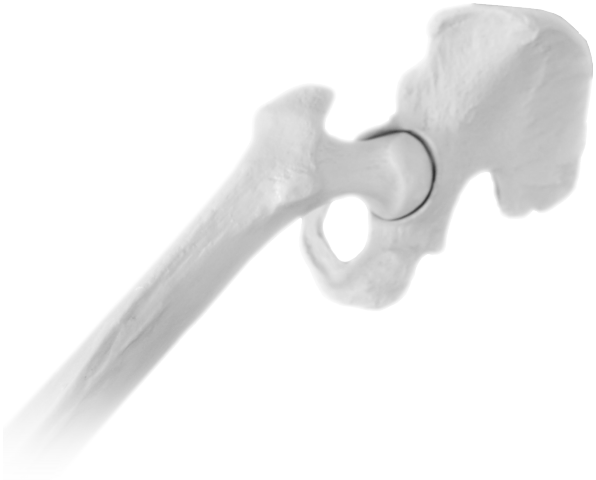
Lateral decubitus position with the affected hip on the top. Put the protective pad under the collateralmalleolus and knee. Place a pillow between knees. The incisionis generally centerd on greater trochanter starts from a point about 6 cmanterior to the posterior superior iliac spine, going distally along the direction of fibers of glutealmaximus to greater trochanter then turn to a direction along femoral shaft going distally for another some centimeters. The length of the incision can be adjusted by Surgones. This is the most common incision with very good exposure.

## 二、这套手术器械适用于小切口手术和各种手术入路，本示例采用后外侧入路切口。
## The instrument set is suitable for small incision THA with different approaches. In this example the Posterolateral approach approach is used.

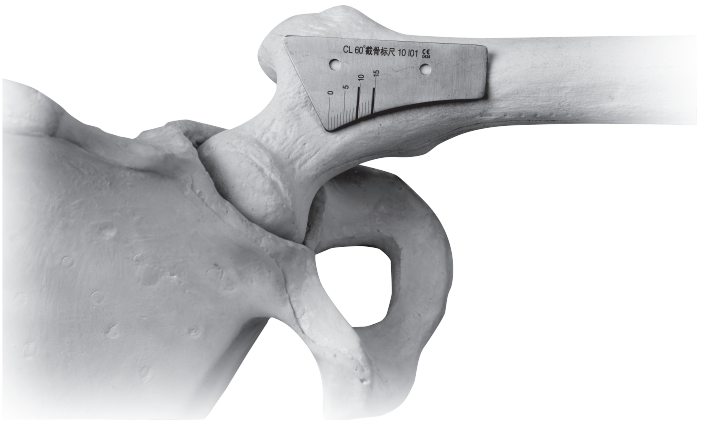
## 三、截骨 Osteotomy

1、关节脱位。如果关节僵直则可先行股骨颈截骨。
Hip dislocation.If facing a stiff hip, we may perform femoral neck osteotomy first.

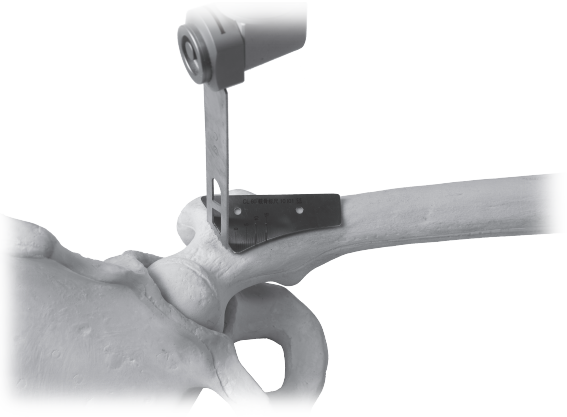




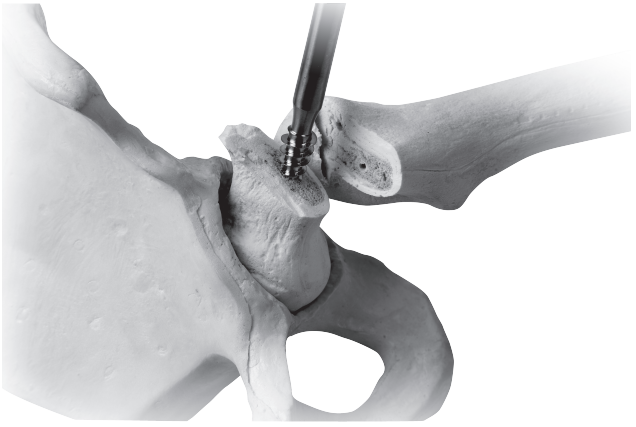
2、用截骨标尺在小粗隆上0.8-1.5 ㎝处截骨。垂直股骨处截骨。
The usual plane for neck osteotomy is about 0.8-1.5cm above the lesser trochanter. Use the osteotomy-guiding ruler to mark on the neck and do the osteotomy perpendicular to the neck.



3、用摆锯截骨
osteotomize the neck with the oscillating saw.



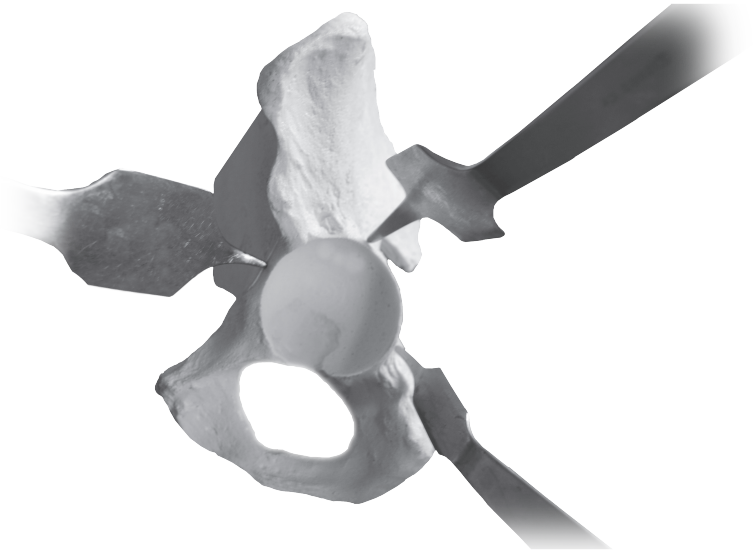
4、用取头器取头
remove the head with the Cork-screw.



## 四、处理髋臼 Acetabulum reaming

1、用髋臼拉钩充分显露髋臼部分，清除骨赘及髋臼内的软组织。尽量保留关节囊，如果术前有内旋畸形或屈曲挛缩的患者，切除前方增厚、挛缩的关节囊，可使患者在术后获得良好的外旋功能，从而完成穿鞋、袜的动作。

After fully expose the acetabulum with retractors, capsule must be reserved as far as possible , excise labrum and osteophytes.



2、用股骨头测量器测出股骨头的型号。

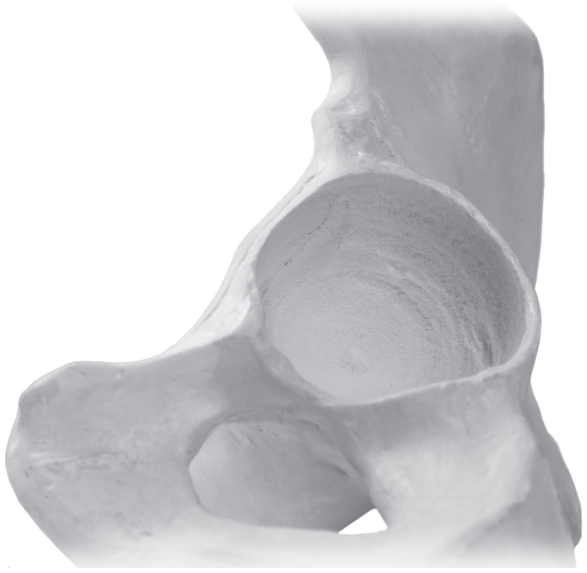
Measure the size of the resected femoral head .

3、用比股骨头直径小两号的髋臼锉（例：50#的头用46#的髋臼锉）或从最小号的髋臼锉开始（注意：用最小号的锉要控制好力度，以免把髋臼底磨锉过深）。连接髋臼锉连杆，准备磨锉髋臼，注意保持髋臼连杆的角度，外展角根据模板测量时臼杯相对泪滴和臼顶的覆盖确定，一般为40°–45°，前倾角的确定为磨锉与髋臼横韧带保持平行或稍大10°（后外侧入路时），内壁紧贴髋臼横韧带内侧。

Start to ream the acetabulum with a reamer 2 sizes smaller than that of the resected head, or begin with the smallest reamer(Notice:when start with the smallest reamer, be careful not to medialize too much.) The orientation of the reamer must be attention ,the abduction is general 40 to 45 degrees can be attained by templating X-ray film pre-operation ,the anteversion of the reamer should be kept parallel to the Transverse Acetabular Ligament with the inferior edge sitting just inside the Transverse Acetabular Ligament.

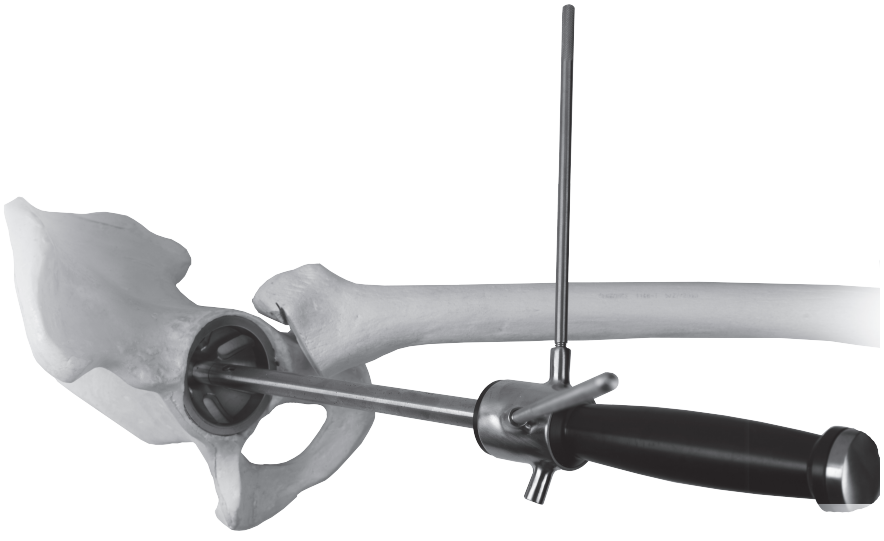
4、用髋臼锉磨锉髋臼软骨，直至髋臼界面有均匀点状出血（注意髋臼锉的型号）。

Ream the acetabulum until bleeding subchondral bone appear.



5、用与最后一个髋臼锉同型号的全髋试杯，安装在金属臼安装器上。
Attach the trial cup of the same size of the last reamer on the handle.

6、打入试杯。注意角度：外展45度前倾15度，量角器的使用：45度杆垂直于手术床（手术床必须是水平的）；15度杆垂直于人体纵轴。
Hammer in the trial cup. Note that the orientation of the cup should be about 45 degrees abduction and 15 degrees anteversion according to the aimer.

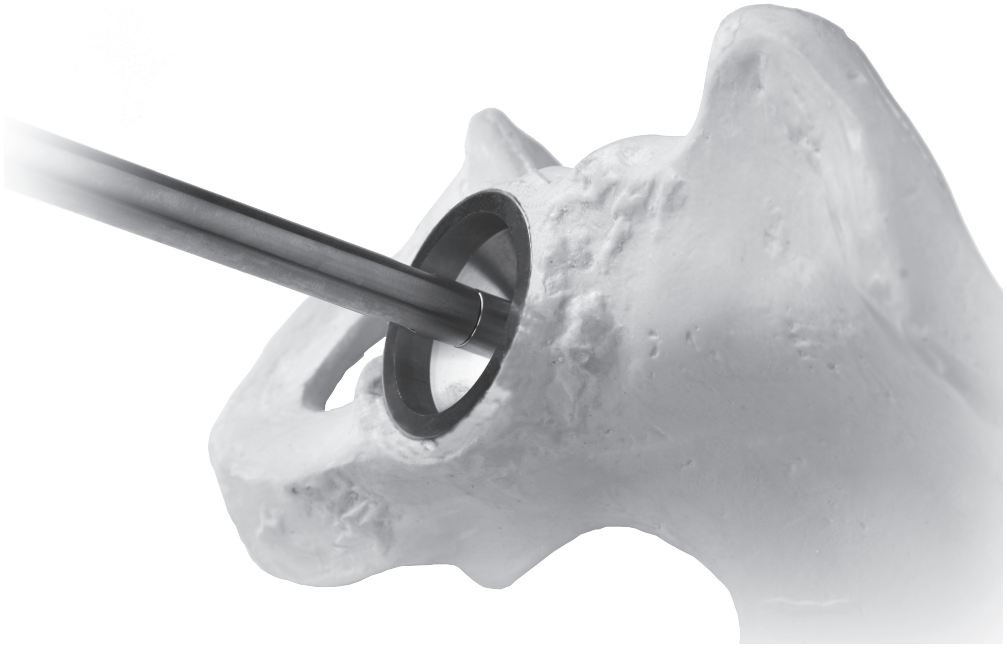


7、角度确定。打入试杯能与髋臼紧密接触，并能固定在髋臼上。则视为型号匹配。如果接触不紧，固定不住，则换大一号的试杯再试，若太紧，可换大一号的髋臼锉稍锉后，继续用试杯再试。注意力度和角度，不要过于用力。一定要在同一个角度的情况下磨锉髋臼 。

Size and angle determination. If the trial cup fit the prepared hole tightly then this one is the correct final size; or, if it was loosened, then need to increase the trial size and/or the reamer size until it fits well. Always be careful of keeping a constant pushing strength and a fixed orientation.

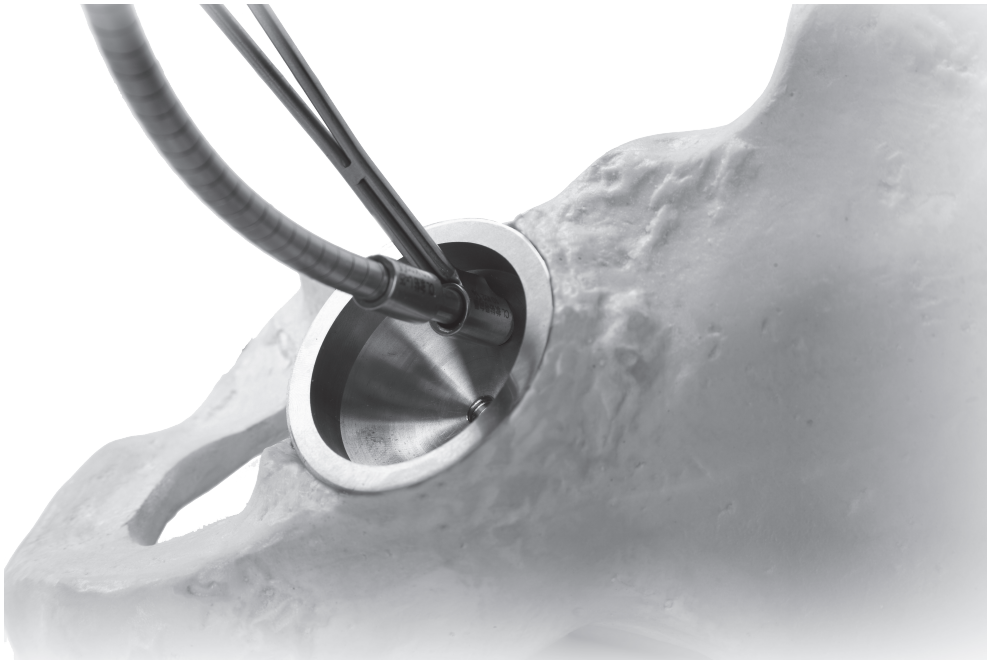
8、打开与试好的试杯同型号的压配杯安装在压配杯安装器上。按相同的角度打入髋臼假体。注：压配杯三孔的位置相近的两孔要放在髋臼的后上方，或时钟的1点2点之间，金属杯底部与髋臼床之间有部分间隙是正常的，我公司设计的三半径髋臼更有利于髋臼杯的稳定。

Assemble the true prosthesis on the handle and hammer it into the socket at the same direction. Note: the cluster holes on the cup should be located on posterosuperior position of the acetabulum about 1-2 oclock position. If any gap between the bottom of cup and the medial wall it may be normal since the design of the cup is not 100% hemispherical and the special designed feature provide a better stability.



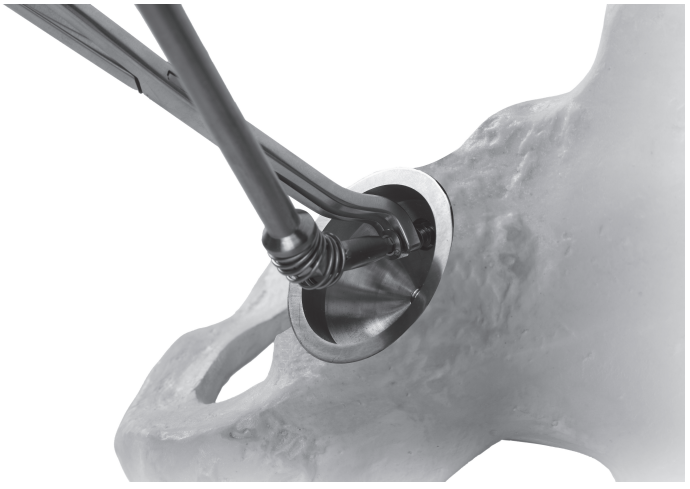
9、 导向器软钻打孔。注意：导向器一定对准钉孔。
Drill through the drilling guide.

10、用测深器测量钉道的深度，选择合适的钛钉。
Measure the depth with the depth gauge and pick the corresponding screw .



11、用万向扳手、持钉钳植入钛钉。一般可植入2枚或以上的螺钉。螺钉只起到初期的固定作用。 当假体与骨床完全咬合在一起，而且有较大接触面积时，视情况可不植入螺钉，用髋臼塞子填充螺钉孔。

Implant the screw with the driver and screw holder. Note: screw number usually should be two or more. Screw fixation just for primary fixation and if primary fixation is considered stable enough then no screw should be use, and in this case screw holes should be covered by the screw caps.

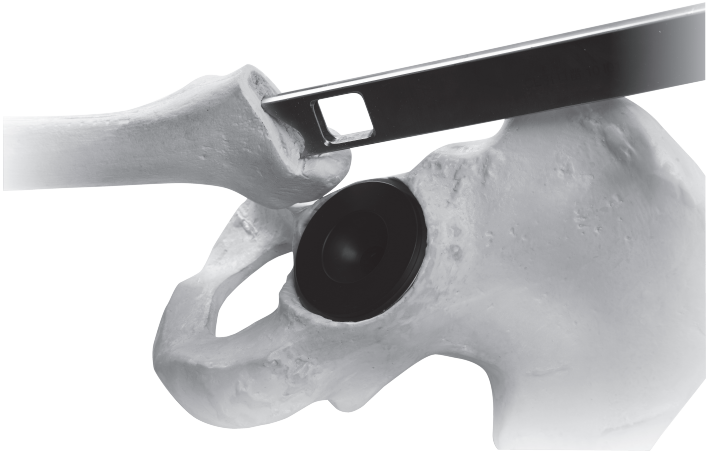


12、安装试衬。

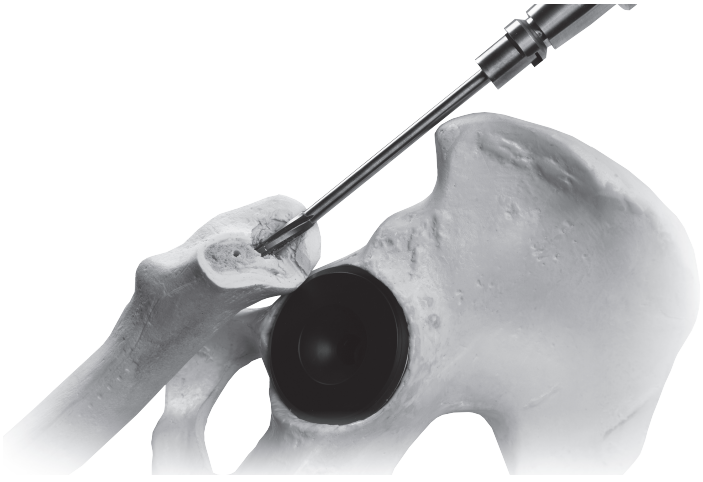
Assemble the liner.

## 五、股骨部分　Femur preparation

1、用开口器紧贴大粗隆外侧，必要时用咬骨钳扩大开口处。（注：前倾角度10～15度）。
Use the opening box osteotome to open the posterolateral canal, alternatively a rounger may be used (anteversion angle: 10~15 degrees).

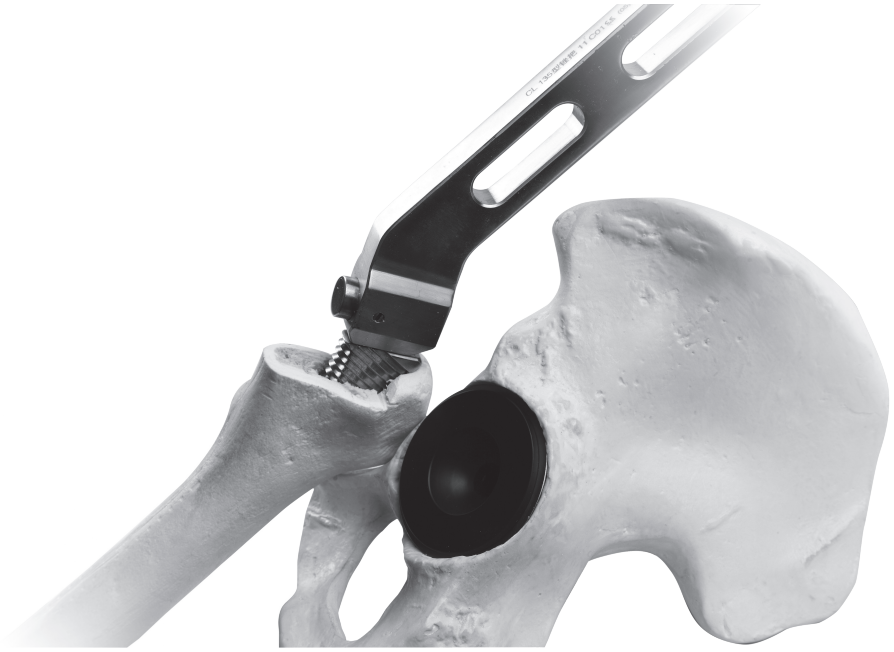


2、用最小号的铰刀沿股骨力线开髓。严格按照铰刀的标志线依次从小号开始铰入，直至阻力较大时为止。并记住铰刀的相应型号。
Ream the medullary canal step by step by an increment of one size until the cortex be felt, note the depth of reaming should be the same as the mark on the corresponding reamer.



3、用髓腔锉把安装髓腔锉。
Assemble the broach on the handle.

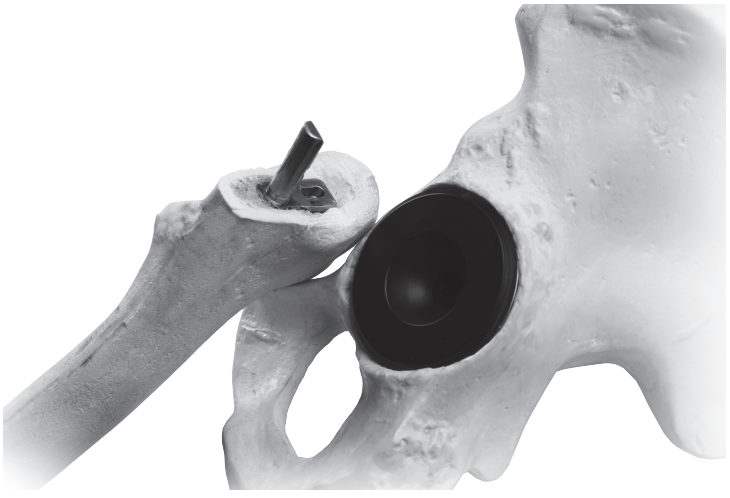
4、从小到大依次选用髓腔锉锉开髓腔。打入过程中一定要沿上次铰刀开髓方向打入。（注：前倾角度10～15度）。
Broach the canal step by step. Be always careful keep broaching in a constant anteversion of 10~15 degrees.



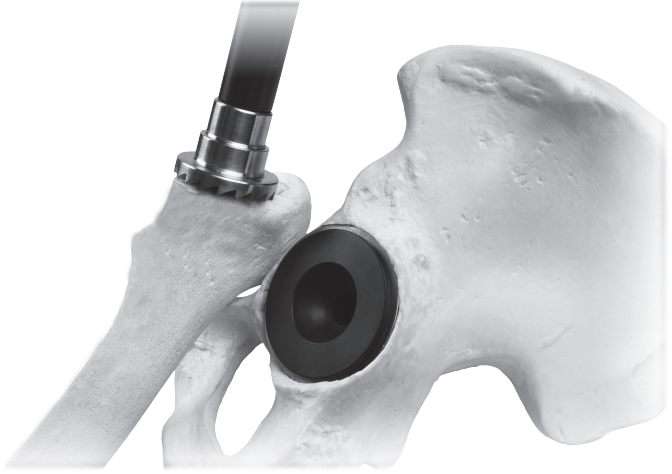
5、最后选择髓腔锉大小型号时，最好与铰刀型号相匹配。（注：髓腔锉的使用要求如下）。
The final broach size should not bigger than the final reamer size. Note in order to safely use the broach.

（1）为避免髓腔压力过大，打髓腔时不宜用力过猛过快，采用两进一退的方式，锉进你打，锉停你停，同时注意前倾角度。
（2）当髓腔锉锉停的型号与原估计型号差距较大时，应拔出髓腔锉刀，看是力线有问题还是髓腔内有异物，应采取相应的措施。
（3）原估计型号不能作为手术中型号的依据，根据手术时实际情况来确定型号。

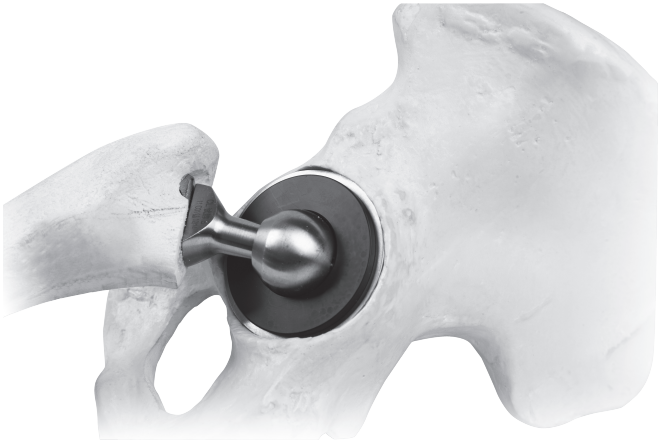
(1) To avoid a high intramedullary pressure, when broaching the canal, a back and forth manner should be used, when it stop to go in further, further broaching should be avoided.
(2) If the final broach size is much different from what is planned, careful revaluation should be performed.
(3) The planned size is always only a reference but not a fixed final implant size.



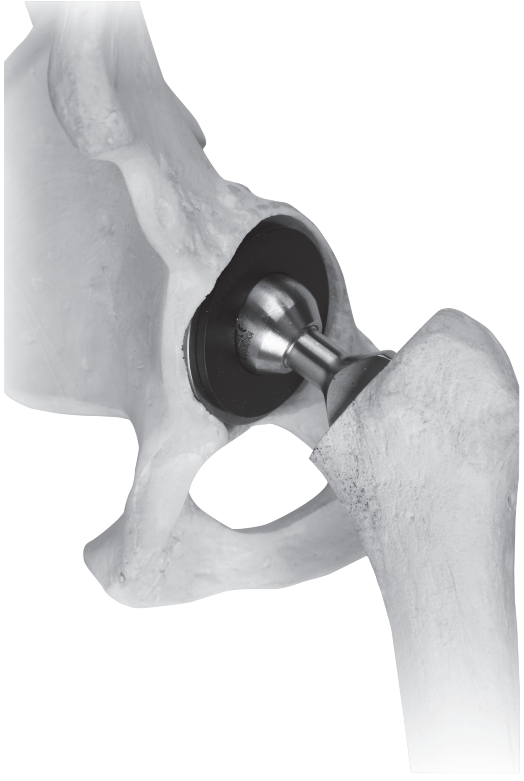
6、将髓腔锉把取下，用平台锉套入髓腔锉颈领，将股骨颈截骨面修平整。
Use a calcar reamer to ream the neck.



7、安装试脖试头（注：0#的为标准试头）。
Assemble the trial neck and head(Note:0# is standard size).



8、复位髋关节，检查髋关节的间隙情况，调节头颈的长短。没有特殊的情况下，不要过紧。看屈髋屈膝位、内外旋及后伸位，有无脱位发生。
Reduce the joint and check the stability.



9、 测试好后安装内衬，把内衬安装在内衬安装器上打入内衬。注：内衬有10度的防脱角度。正常情况下，10度防脱角度放在髋臼的后上方。（即1～2点之间）
After the final implant size be choosen, put the liner in the cup. (Note: the liner is designed as a elevated liner and the 10 degree higher side usually be put on the posterolateral side of the acetabulum.

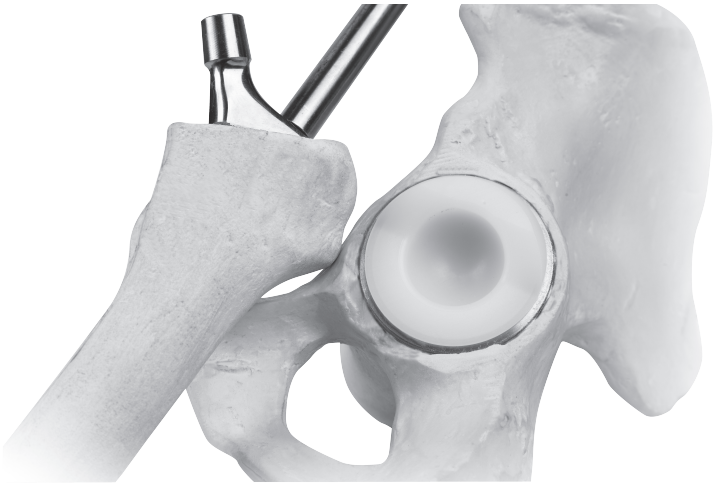
10、用内衬打入器打紧。（注：金属杯与内衬不要有缝隙）
Futher hammer the liner a couple of times in the cup to make a tight fit.

11、取下试头试脖，安装髓腔锉把取下髓腔锉。
Remove the trial head,neck and broach.

12、打开与最后一把髓腔锉相同型号的假体，装在持柄打入器上打入假体。
Assemble the true stem of the same size of the last broach on the handle.

13、慢慢打入股骨髓腔，注：当打入与髓腔锉刀型号相同的假体，假体不能完全打入时，应拔出假体，重新处理髓腔，当打入假体较松时，应选择大一号的假体，确保假体初期的稳定性（注：由于病人髓腔及骨质的不同， 以及医生手法的不同，会表现出不同的假体松紧状态，应在手术过程中随时调整）。

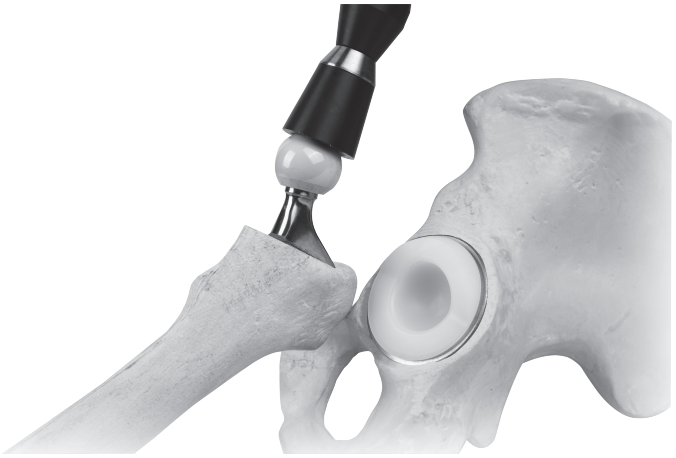
Hammer slowly the stem in the canal. If stem can not acquire adequate primary stability then adjustment of stem size should be considered.



14、再次安装相同型号的试头，复位，检查关节的松紧度，确定球头的型号取下试头。

Retry the trial head and neck again.

15、将假体柄的锥颈部擦拭干净，安装球头。用球头打入器轻击2～3下即可。
After clean the neck head adapter completely, assemble the final true head and hammer it 2-3 times with the special tool.



16、复位关节。冲洗关节腔。放置引流。缝合，手术结束。
Perform joint reduction. Irrigate the joint thoroughly.
Put it the drainage. Close the wound. End the surgery.