

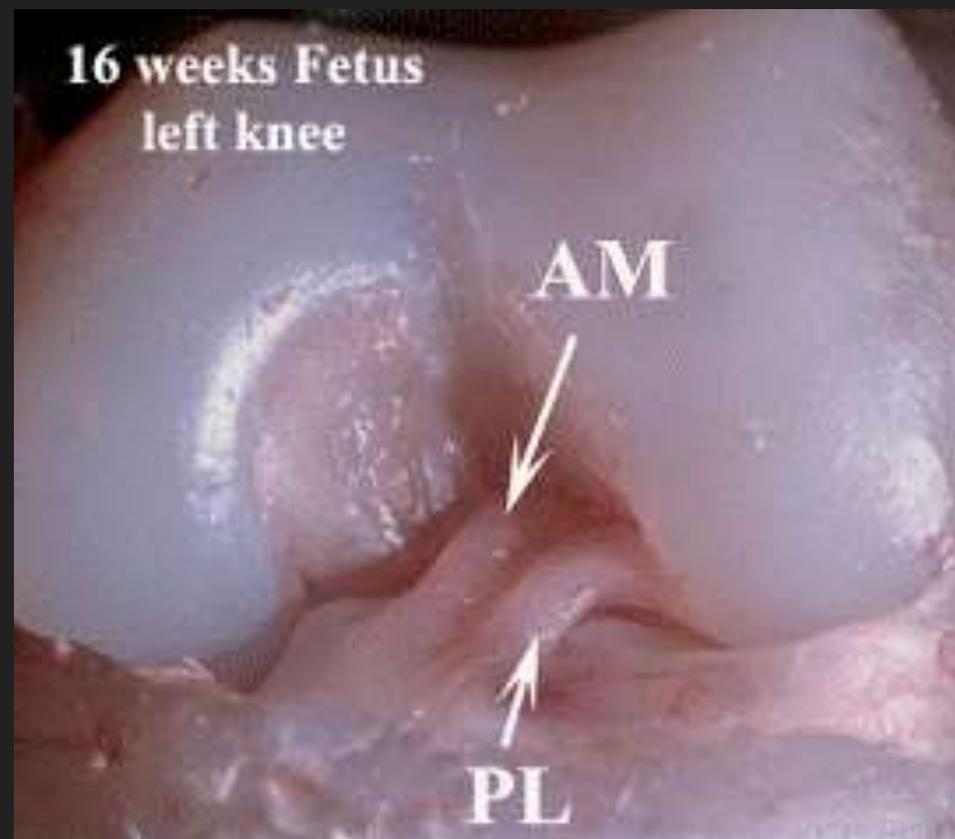
前交叉韧带断裂的关节镜微创治疗

赣州市中医院 骨四科

-----孙小波

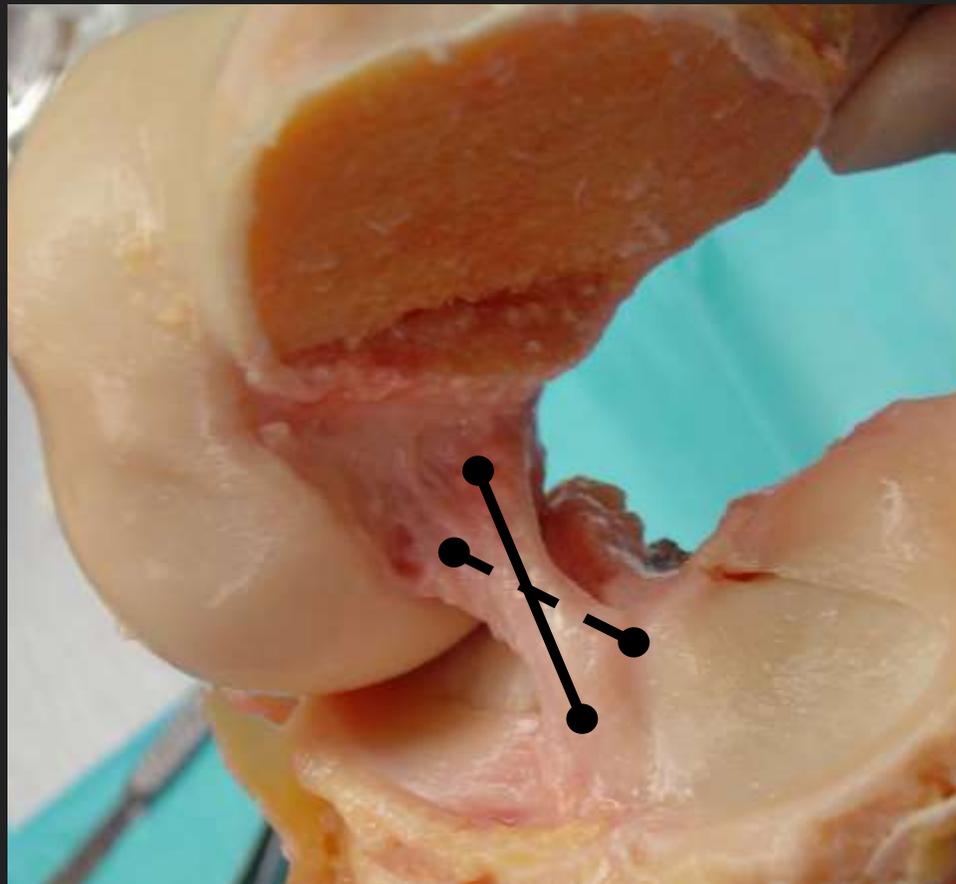
ACL解剖

- 研究已经显示ACL自然解剖含有2单独的束：
- 前内束 (AM)
- 后外束 (PL)
- 这些清楚的可以在怀孕16周的胎儿看到



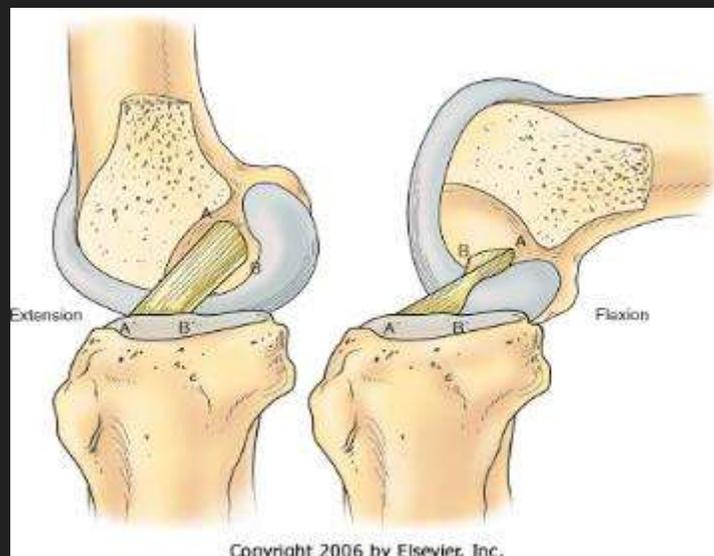
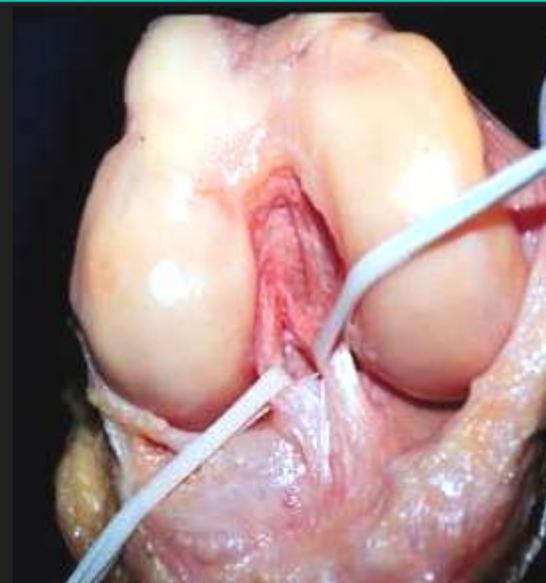
ACL解剖

- ACL不仅是一个机械结构，也是一个本体感觉器官
- ACL富含神经及血管，它在维持膝关节机械稳定的同时，也协助维持膝关节平衡



ACL功能

- 限制胫骨前移
- 限制过伸
- 限制内外旋活动
- 限制内外翻活动



ACL损伤

- 发生率高，但容易漏诊。
- 病因：摔伤、扭伤或车祸伤。
- 临床表现：
 - 不能快速走路和跑步
 - 行走时突然打软腿，甚至摔倒
 - 关节软骨和半月板损伤表现

诊断

- 体检:

 - 前抽屉试验—假阳性率较高

 - Lachman试验、轴移试验—检查手法大多医生不大熟悉

- 辅助检查:

 - MRI检查—临床常用检查手段

 - KT-2000

 - 关节镜检查



诊断正常前交叉韧带MRI表现

- 在各种序列的MRI图像上，
- 前交叉韧带为一带状的低信号影



ACL损伤后MRI表现

- 前交叉韧带连续性中断
- 前交叉韧带连续但扭曲呈波浪状
- 在T2加权像上，前交叉韧带内呈弥漫性的高信号改变。

前交叉韧带连续性中断



在T2加权像上前交叉韧带内呈弥漫性的高信号改变



ACL重建目标

- 肿胀和疼痛的消除
- 关节活动度和肌肉强度的恢复
- 本体感觉的恢复
- 重新工作和运动
- 预防退化性骨关节炎
- 恢复正常的膝关节运动和功能

手术步骤：

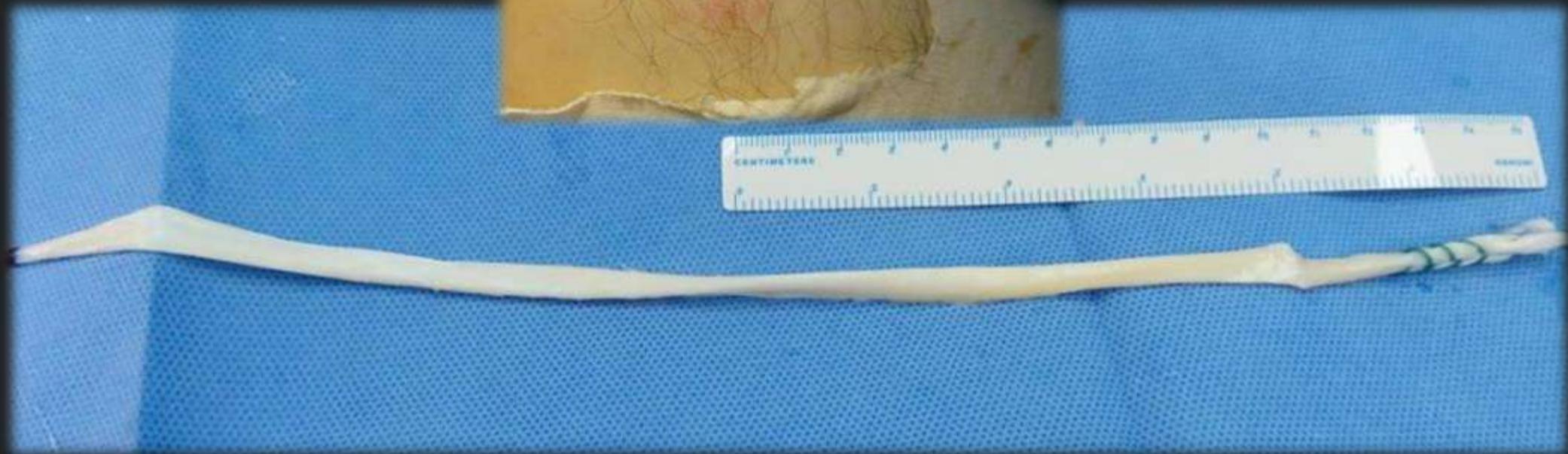
一、半腱肌腱的切取

二、骨隧道的建立

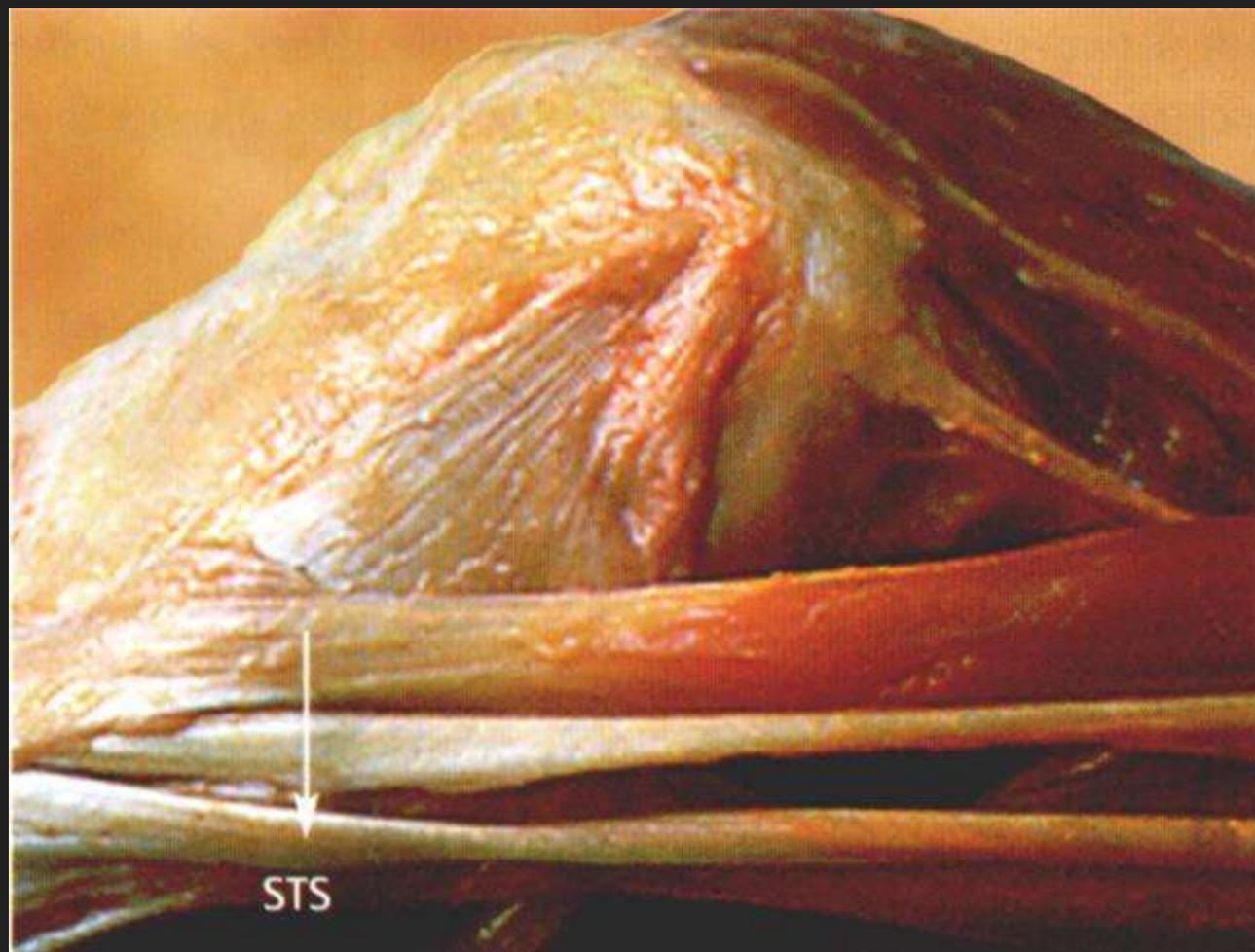
三、半腱肌腱的准备

四、移植物的植入和固定

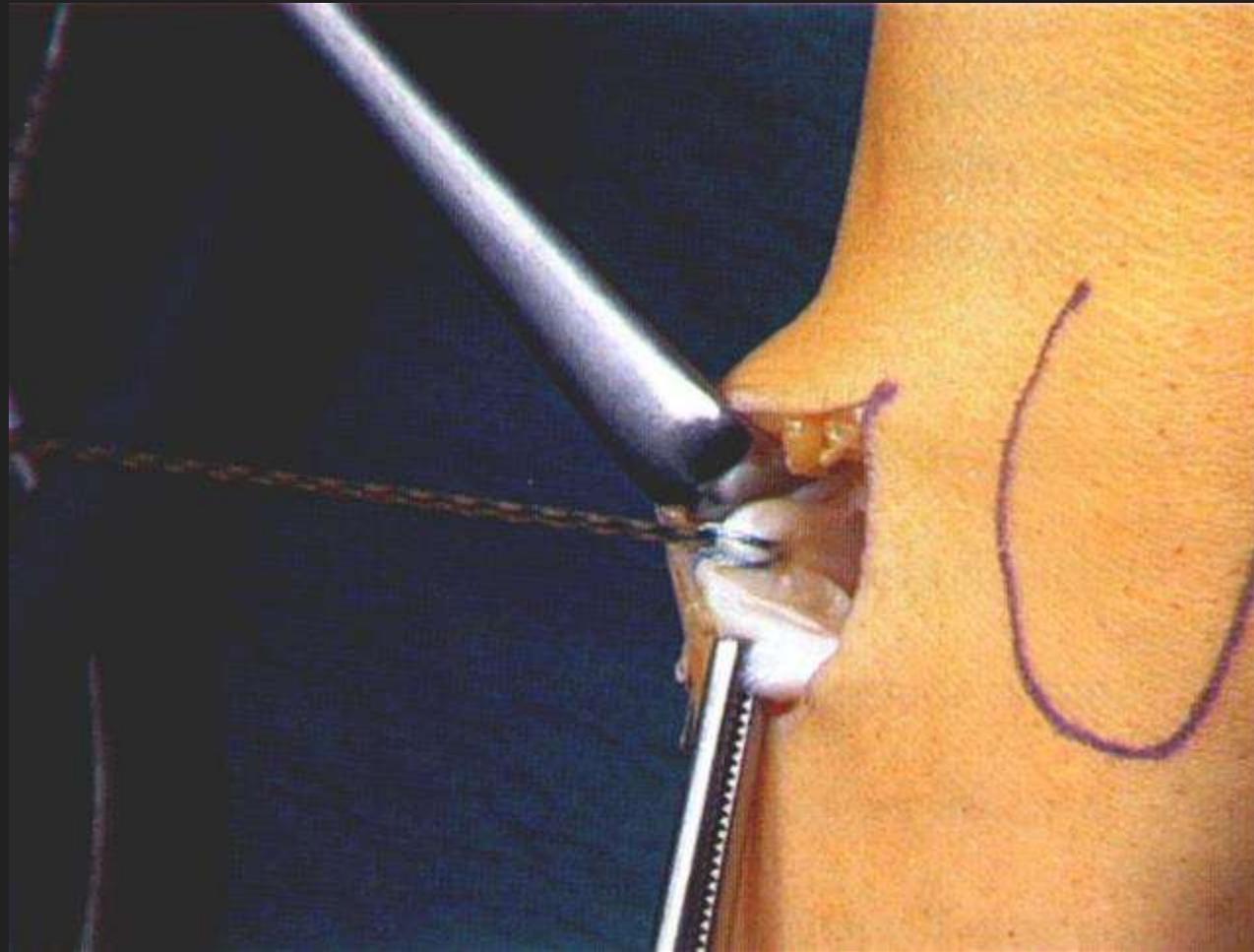
手术入路



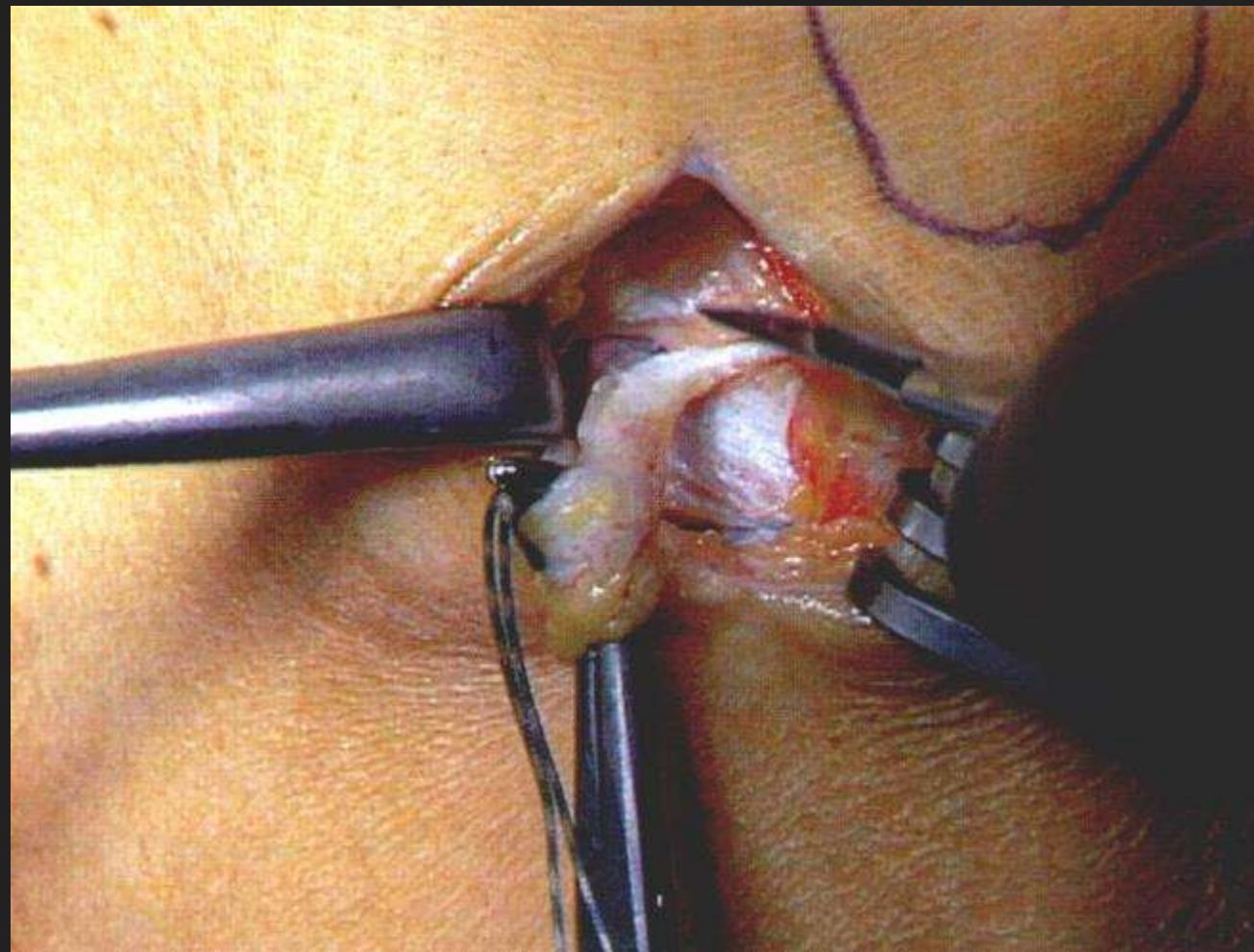
鹅足的组成及排列



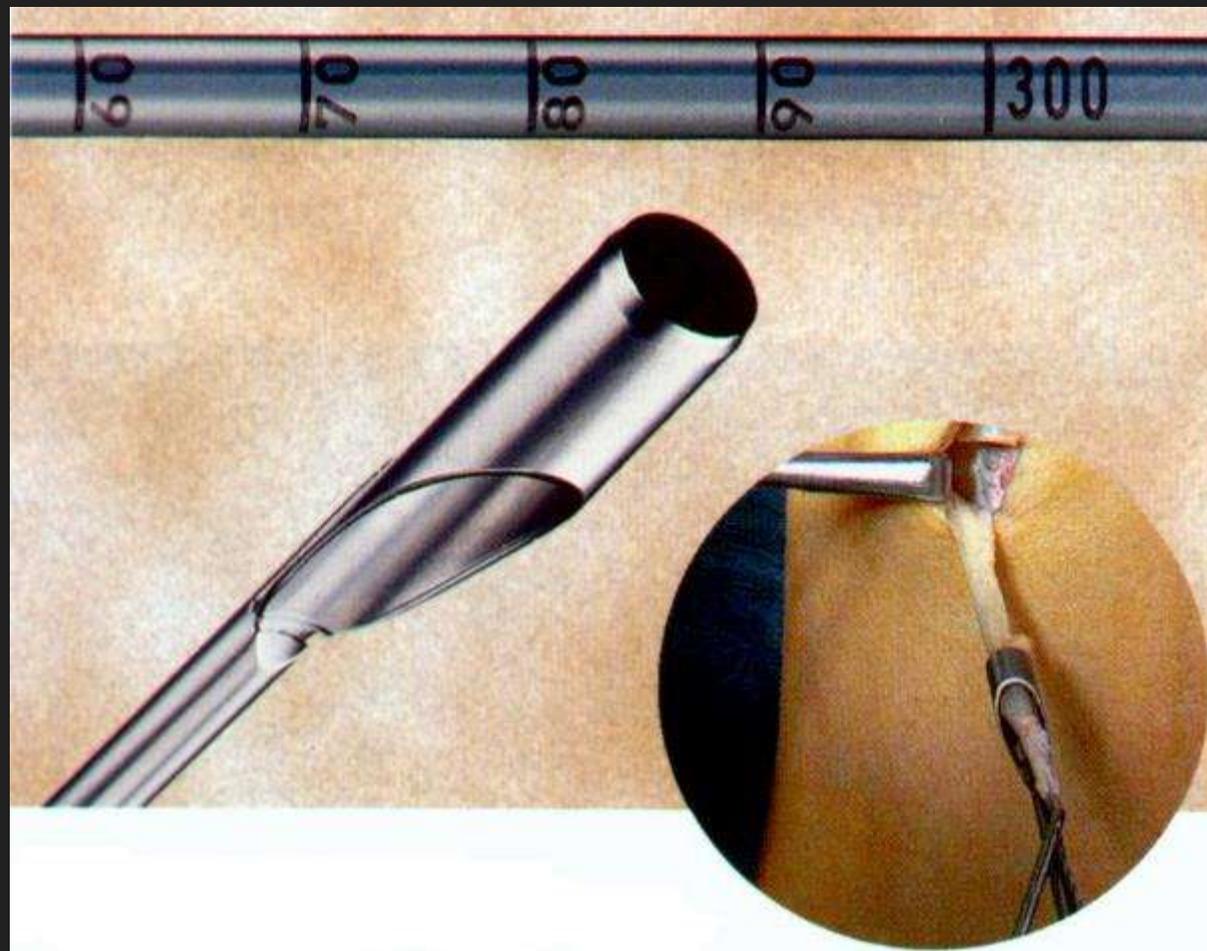
找出半腱肌



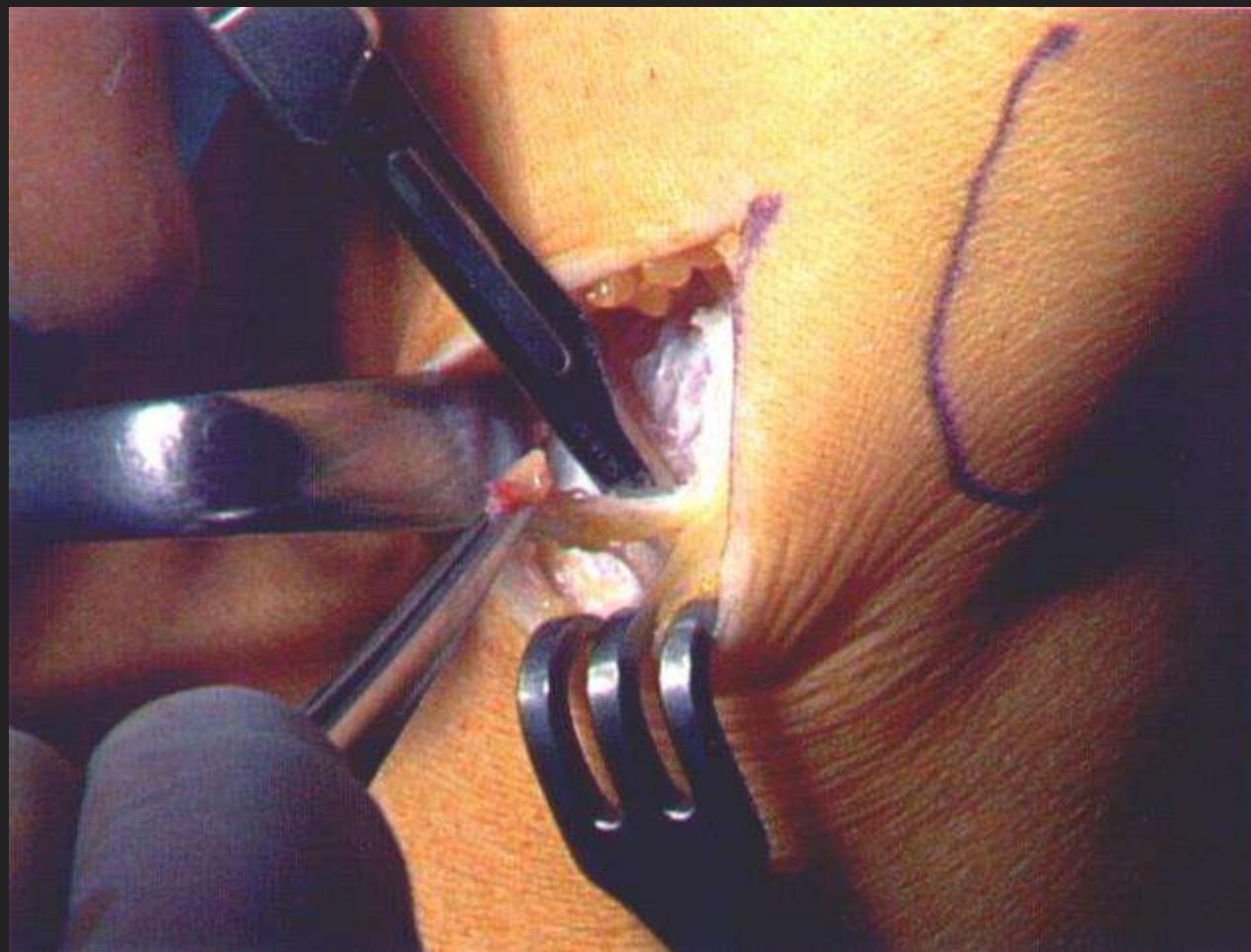
在止点部位可多切取
约2cm长的骨膜条



使用肌腱剥离套管管剥取肌腱

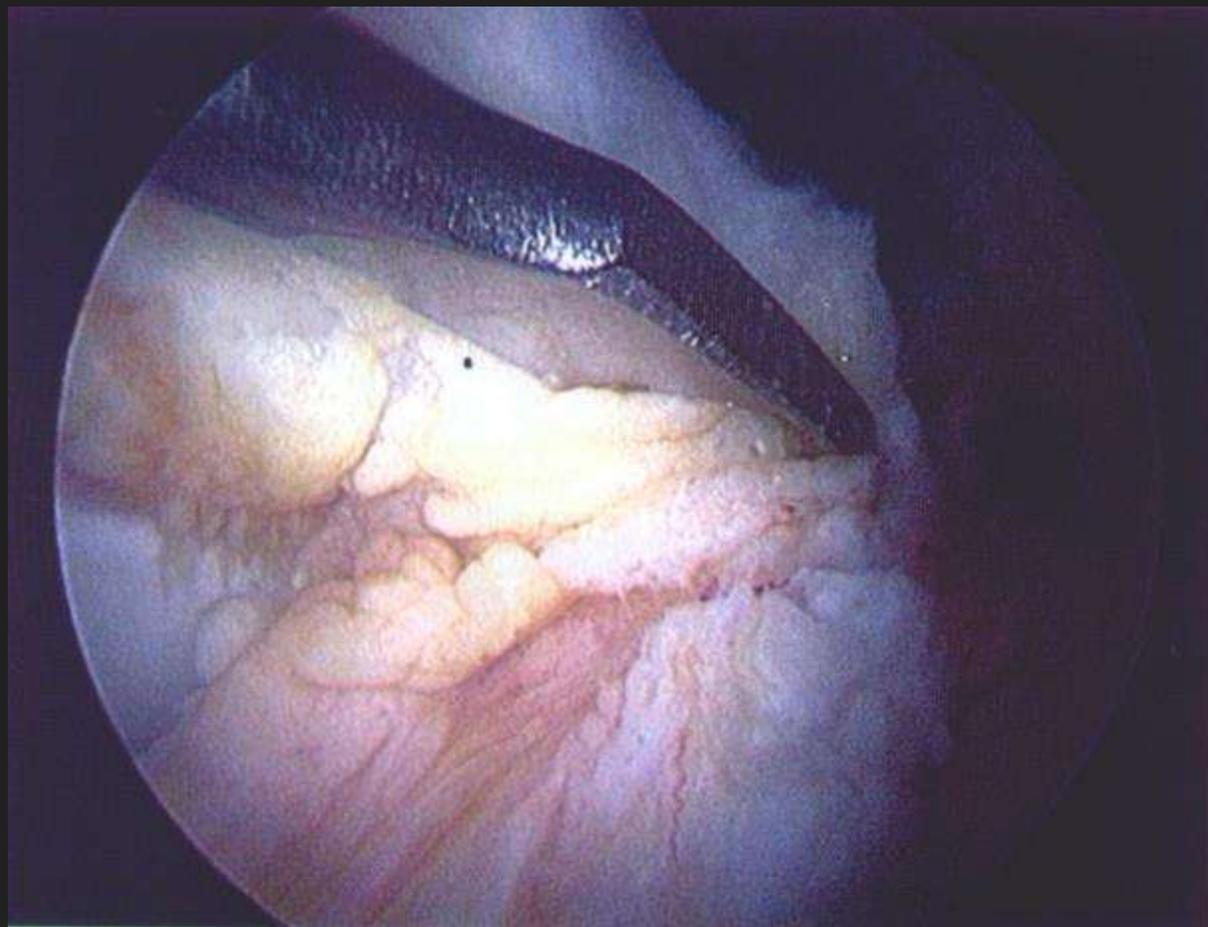


最好能于鹅足下切取部分骨膜



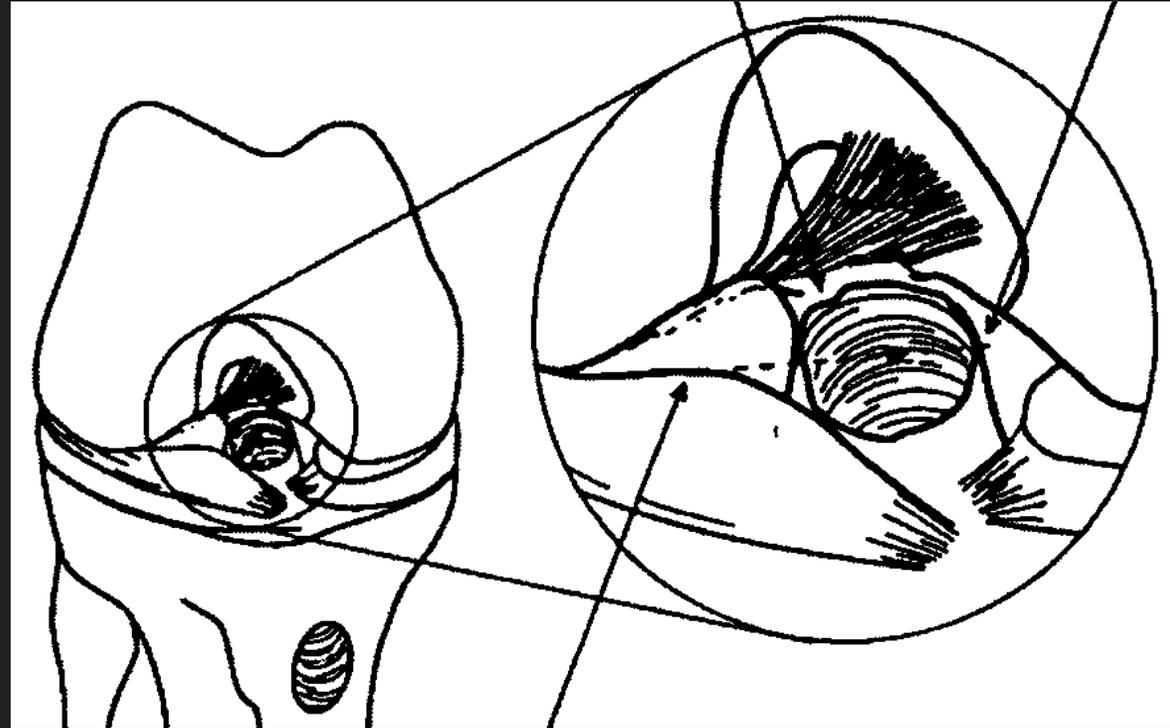
骨隧道的建立

胫骨隧道—参考原ACL残端定位



无前交叉韧带残端时依靠胫骨髁间棘定位

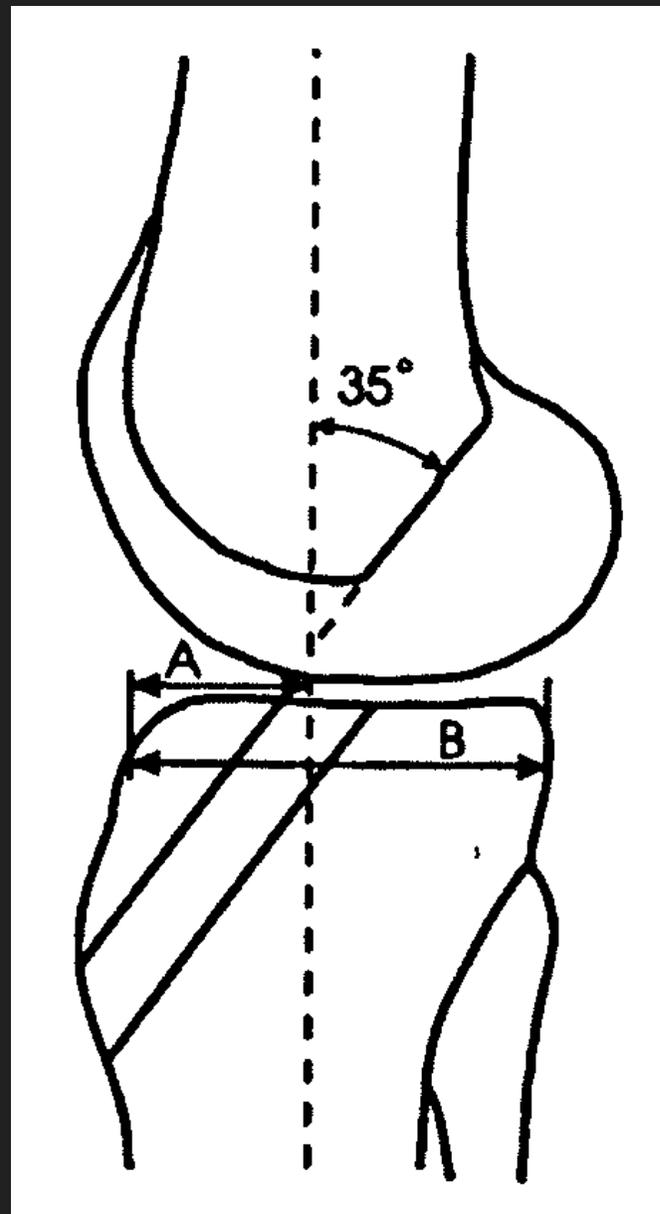
髁间棘顶部 外侧髁间棘



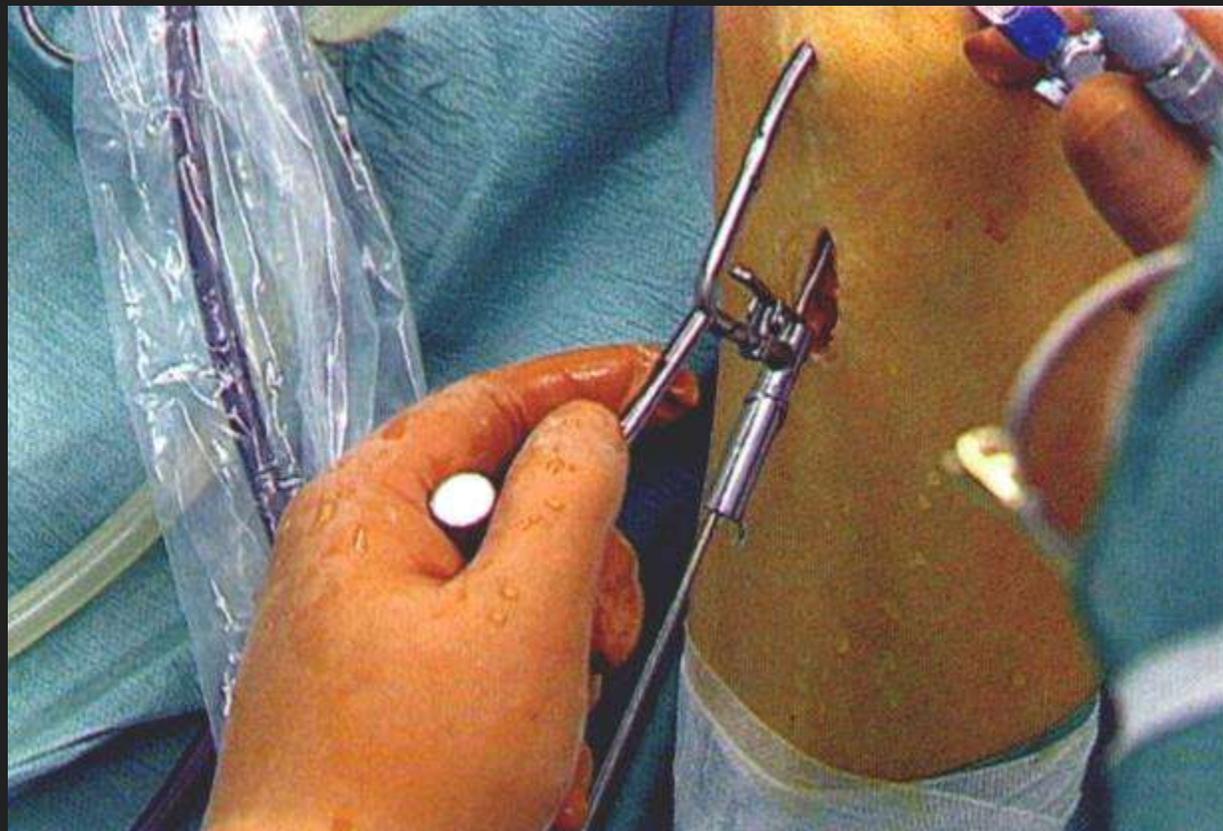
内侧半月板

骨隧道的建立

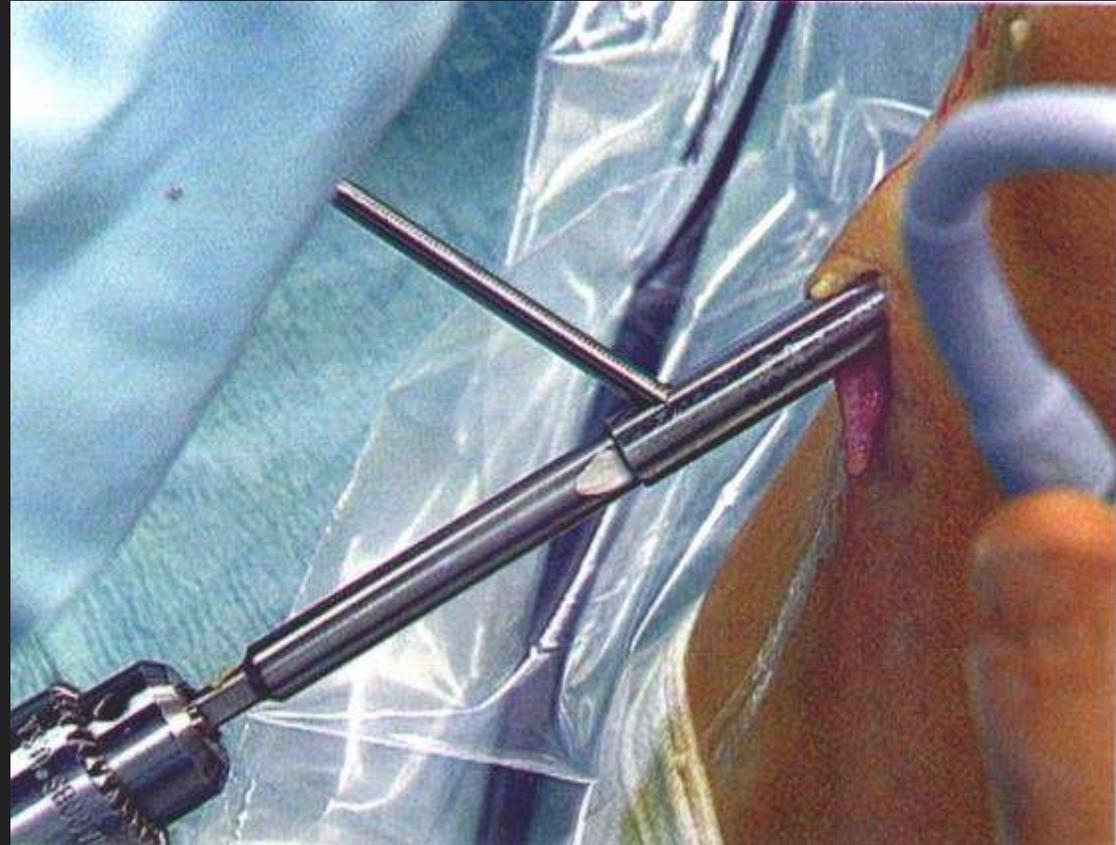
胫骨隧道与胫骨平台面成角50-60°，亦即与胫骨纵轴成角40-50°



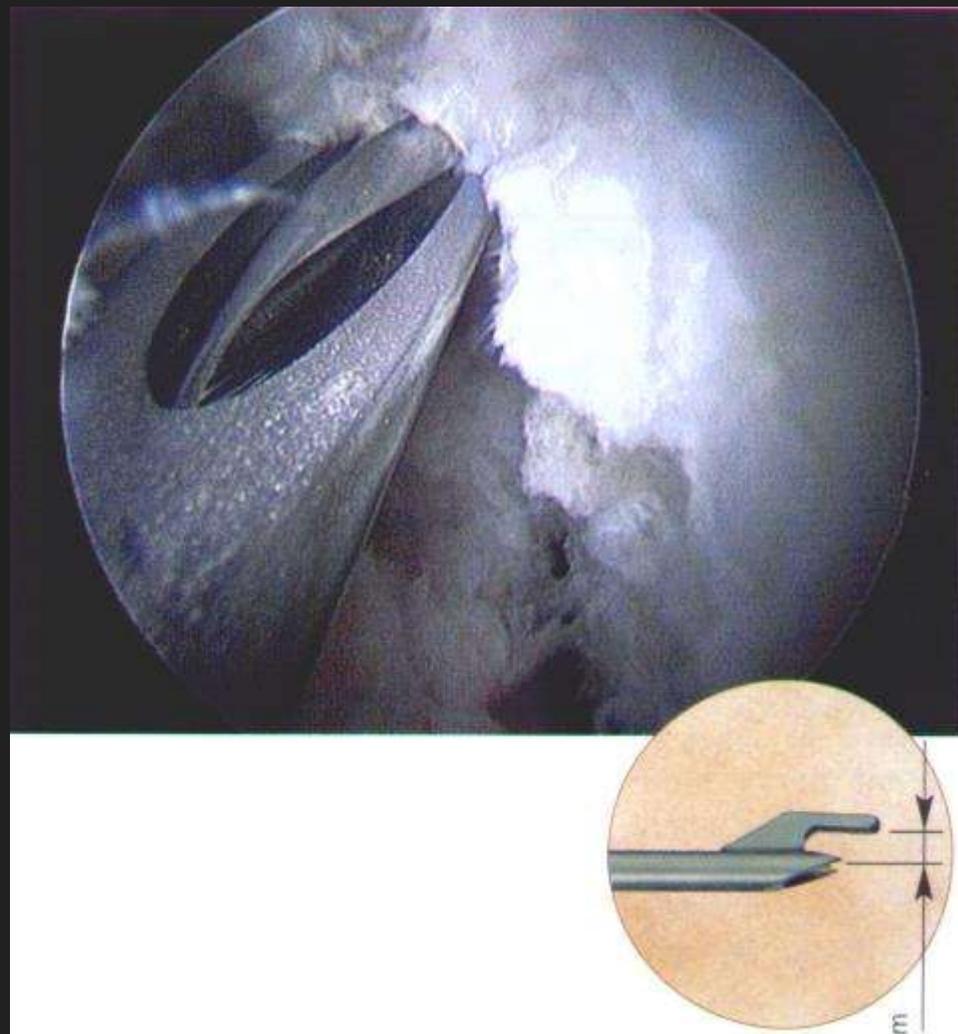
钻入导针



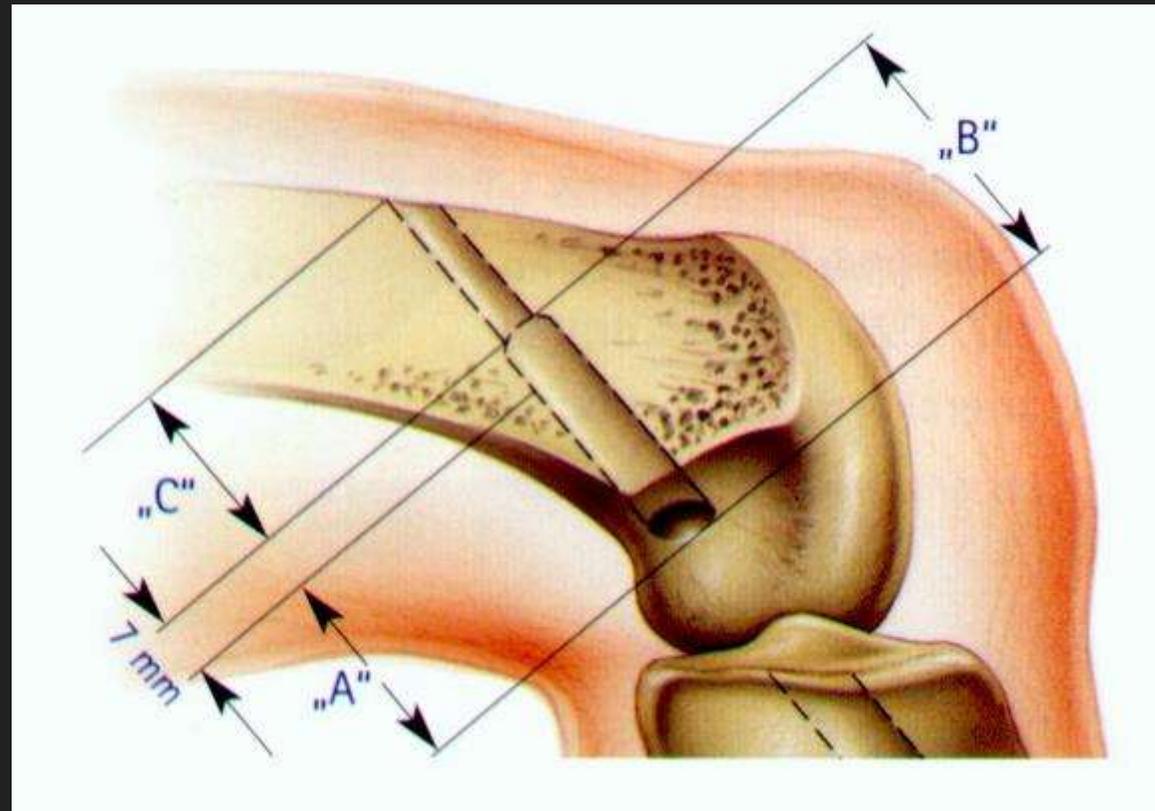
**先以6mm钻头钻骨隧道，
再根据植入物直径钻最终隧道**



经胫骨隧道
插入5mm
距差股骨隧
道定位器，
先钻入导针

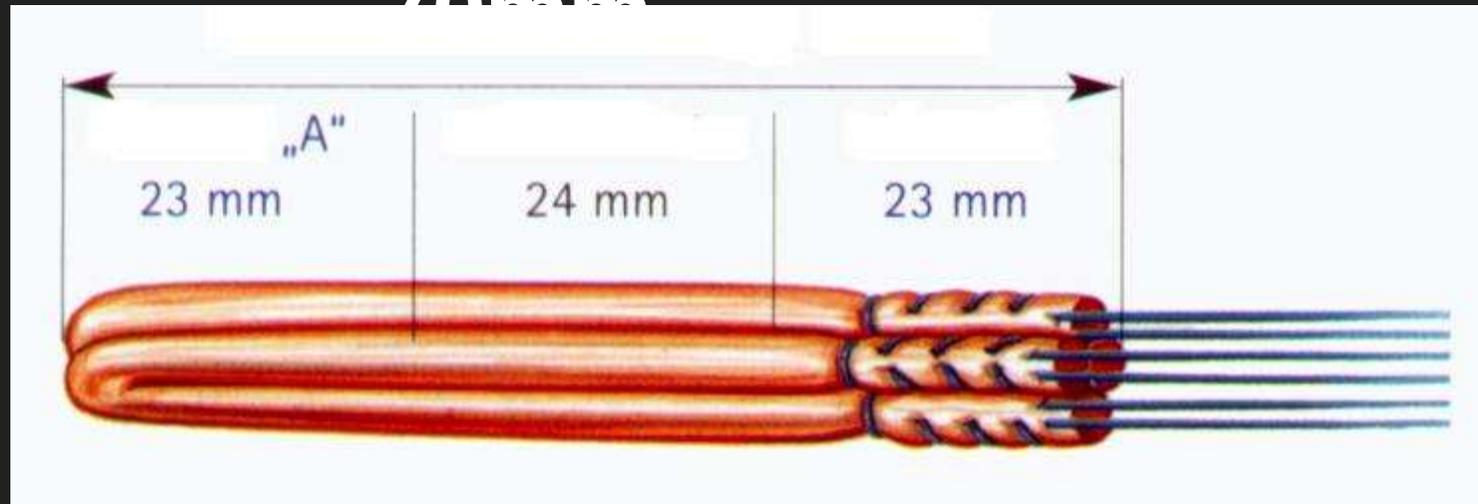


骨隧道的深度 “B”
= 隧道内移植物长度 (“A”)
+ 翻转所需深度 (7mm)



关节腔内韧带长度 21-24mm

假设移植植物总长
70mm



骨隧道深度 $23\text{mm} + 7\text{mm} = 30\text{mm}$

翻转缝线钢板所需长度

缝线钢板长
12mm

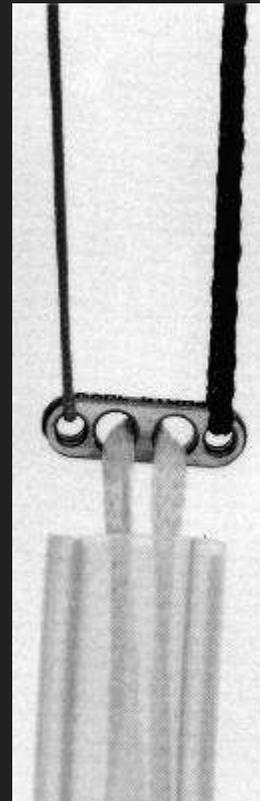
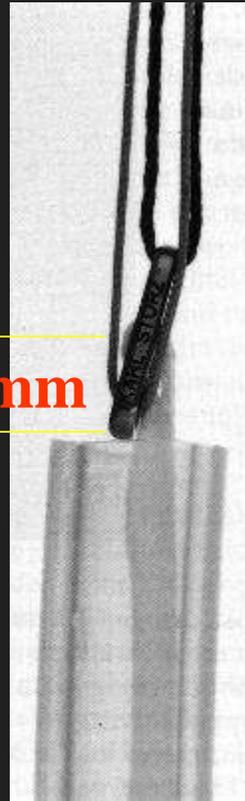


翻转需

6mm + 1
mm

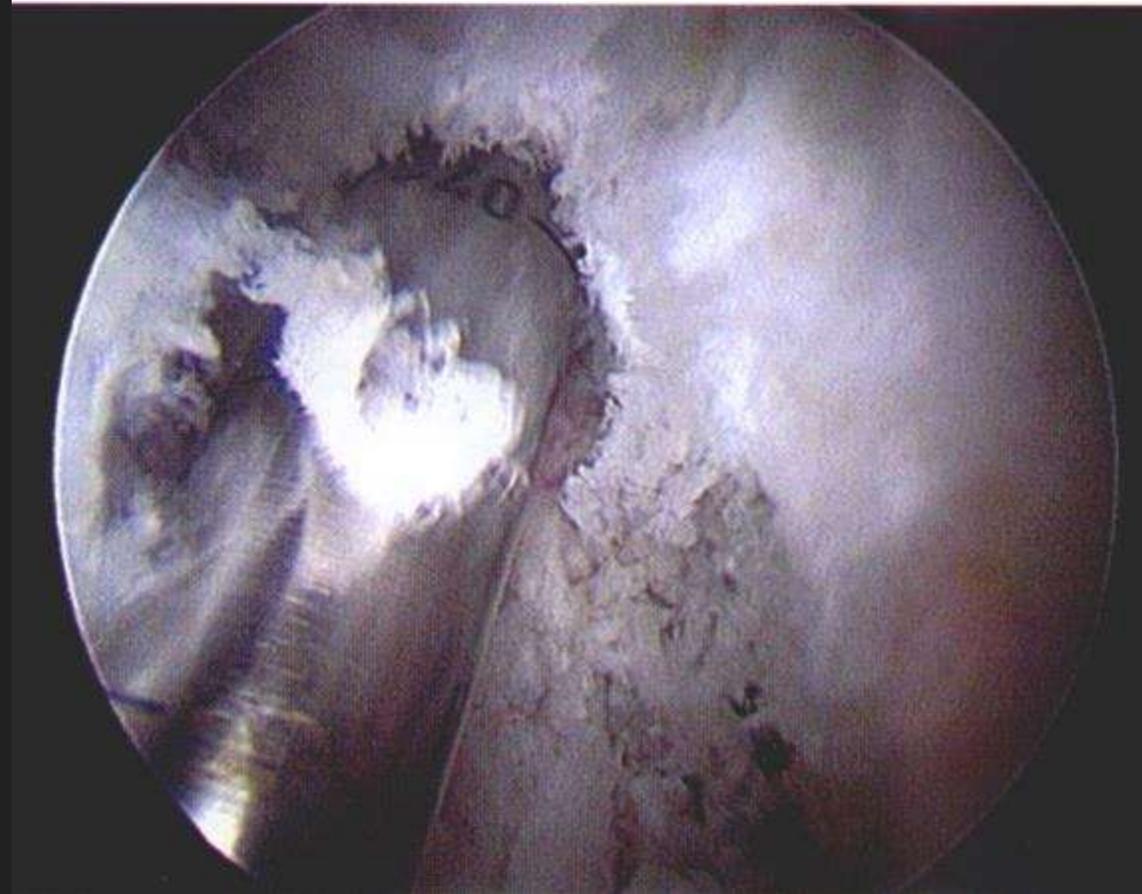
= 7mm

6mm



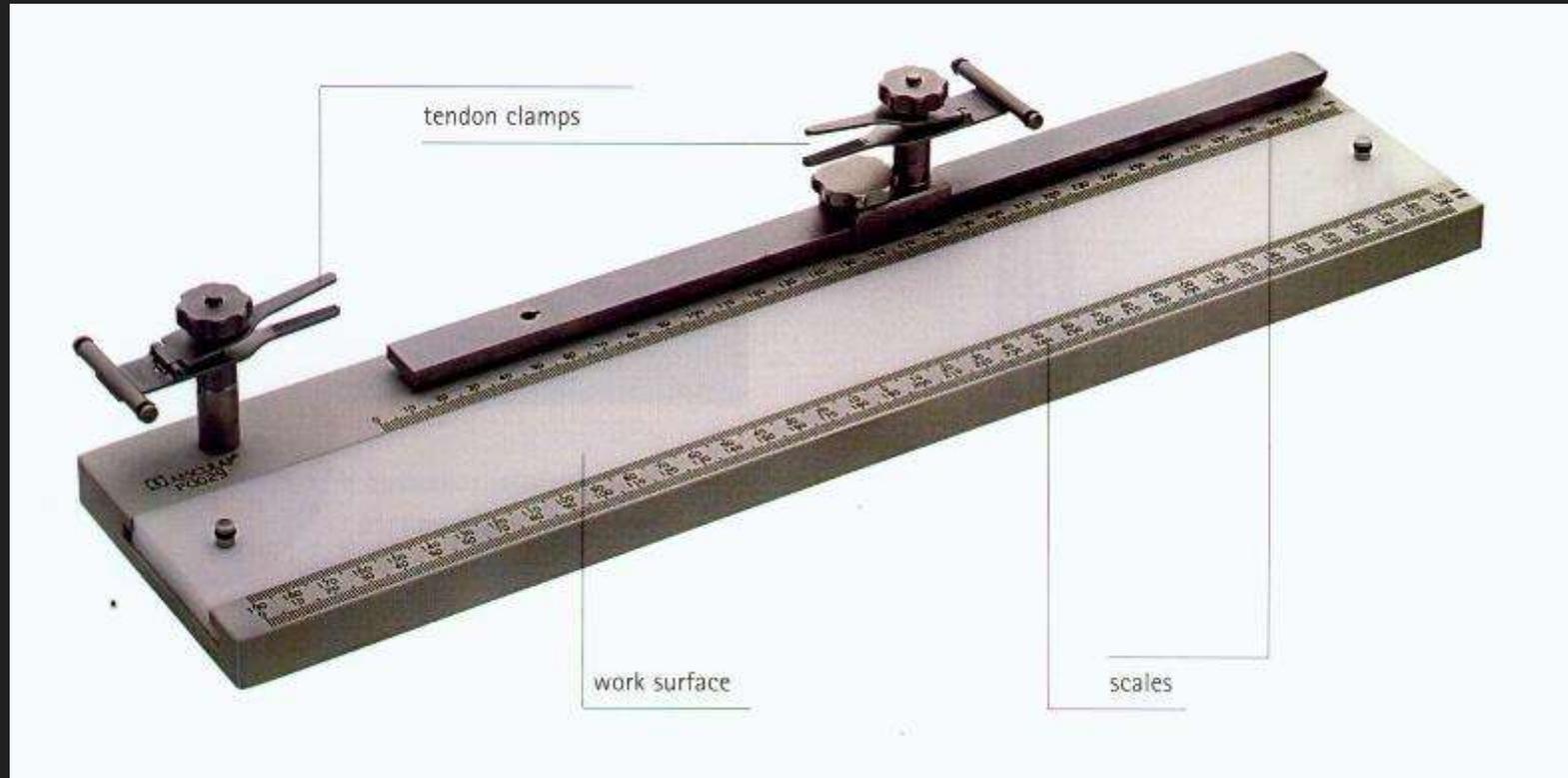
骨隧道的建立

根据计算所得深度钻股骨隧道



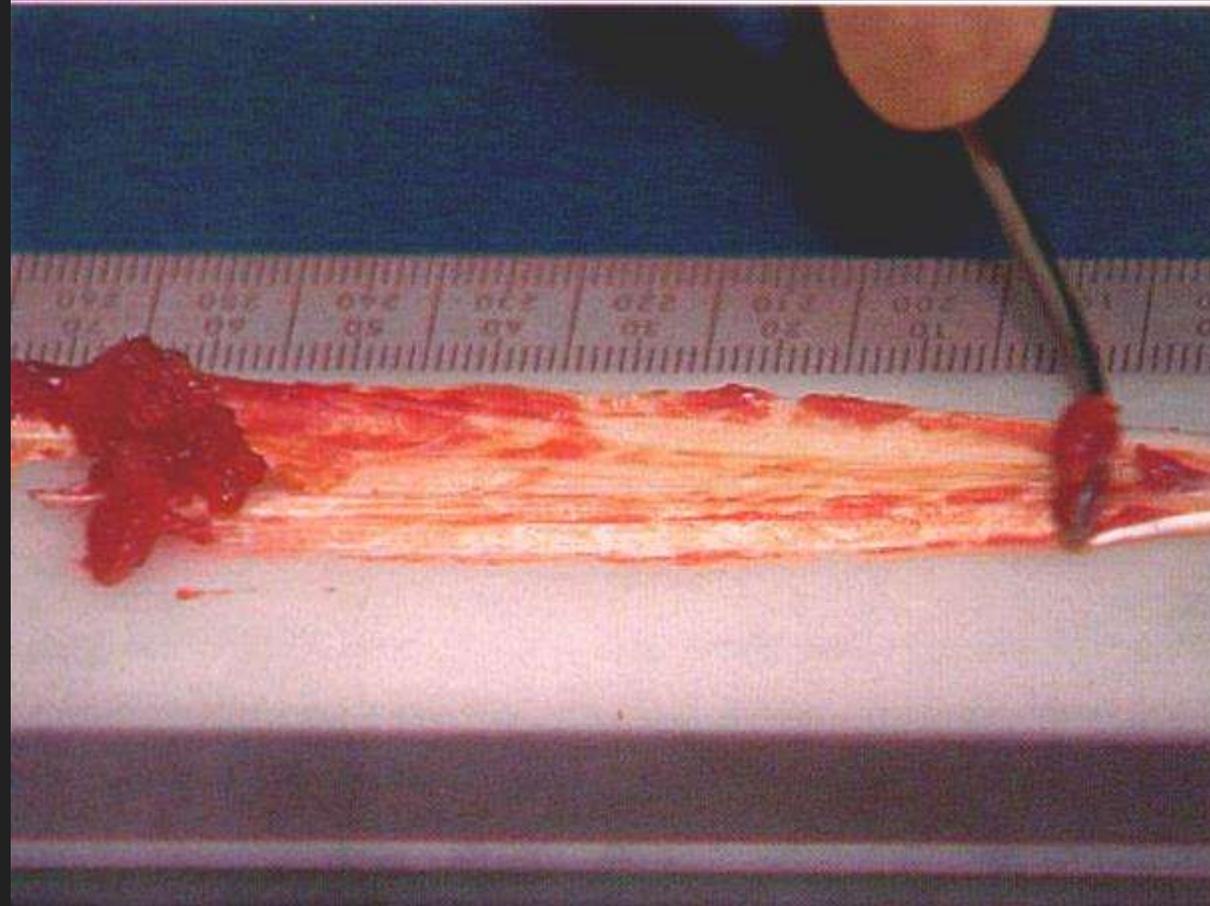
半腱肌肌腱的准备

肌腱操作板：测量、切割、缝织、预牵张



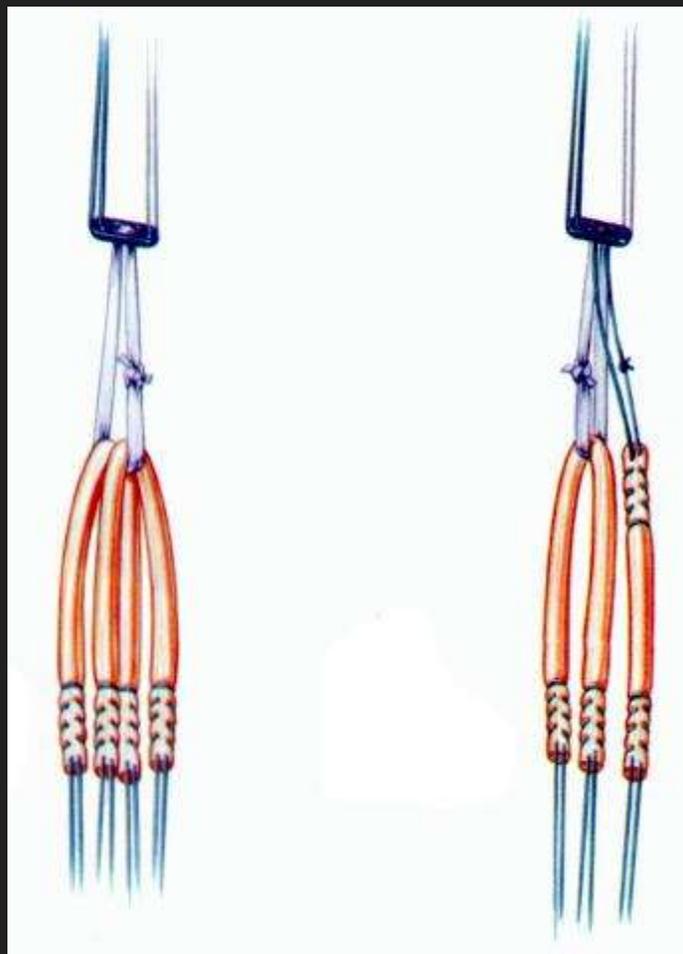
半腱肌腱的准备

刮除肌肉组织



肌腱总长
>24cm

四束法

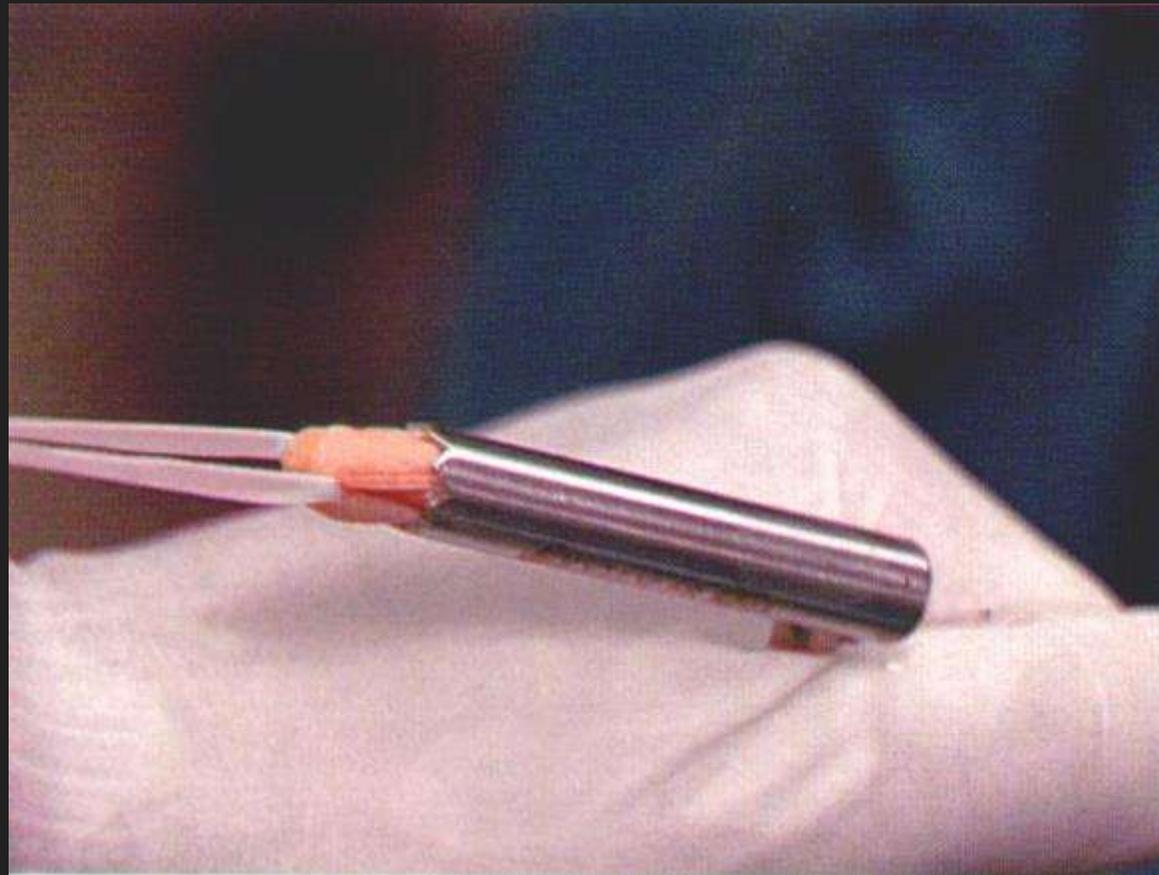


肌腱总长
<24cm

三束法

最终束长 \geq 6cm!

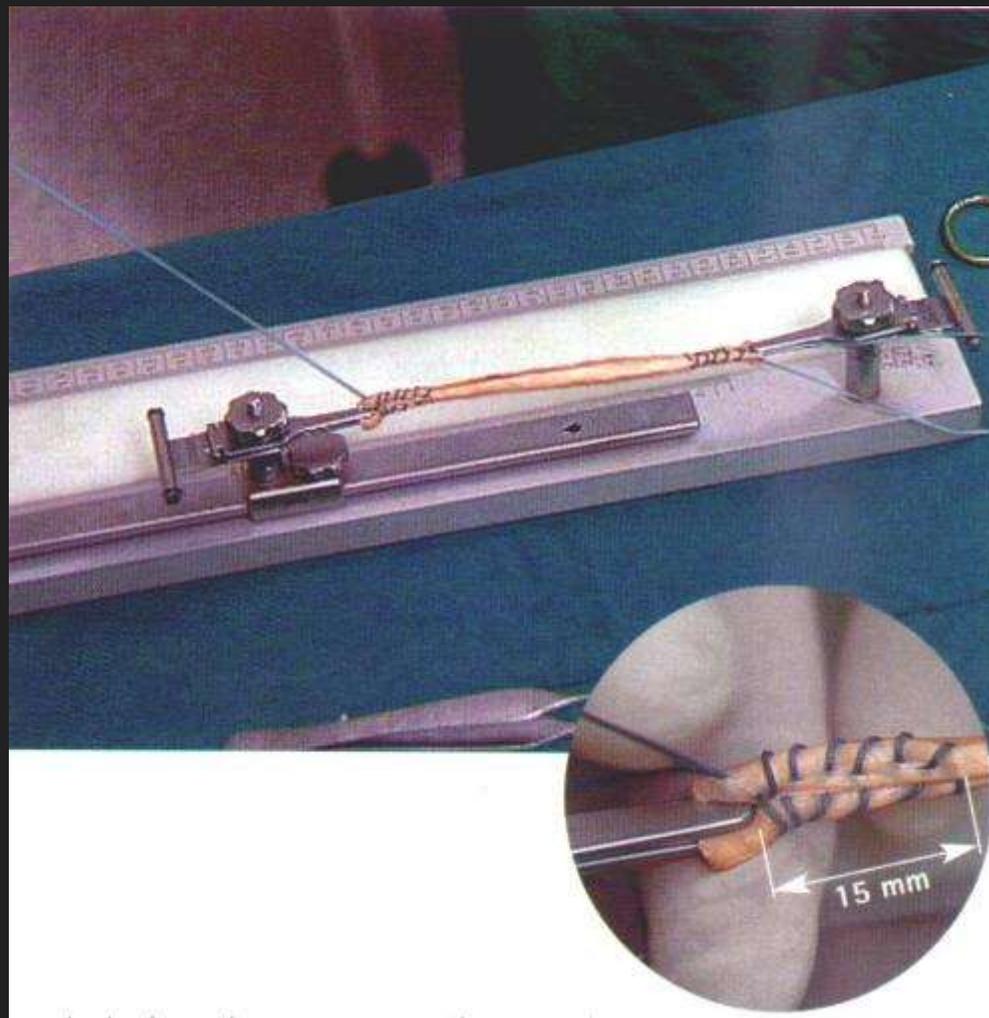
用钻头套管测移植物的直径



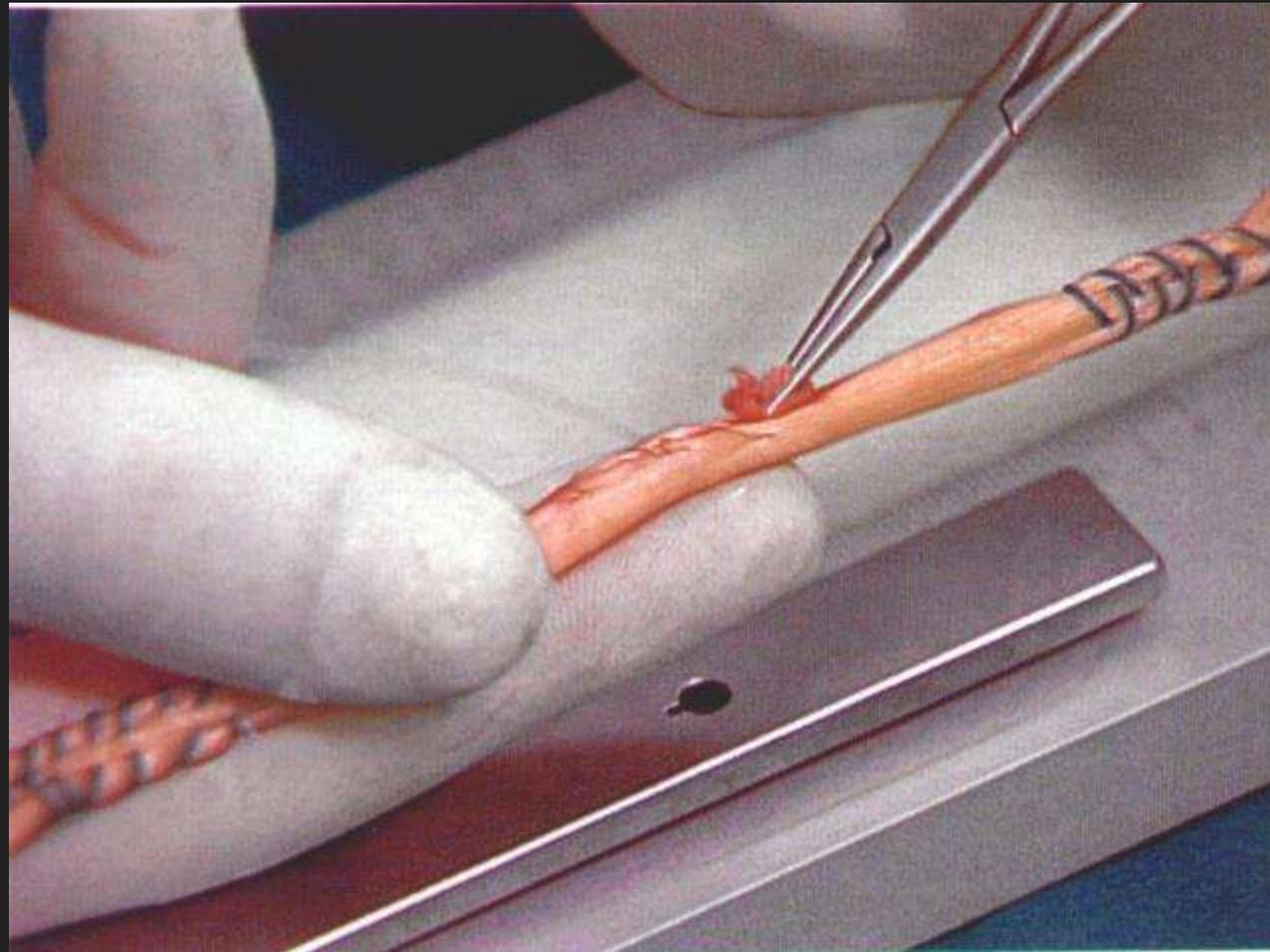
缝织半腱肌腱

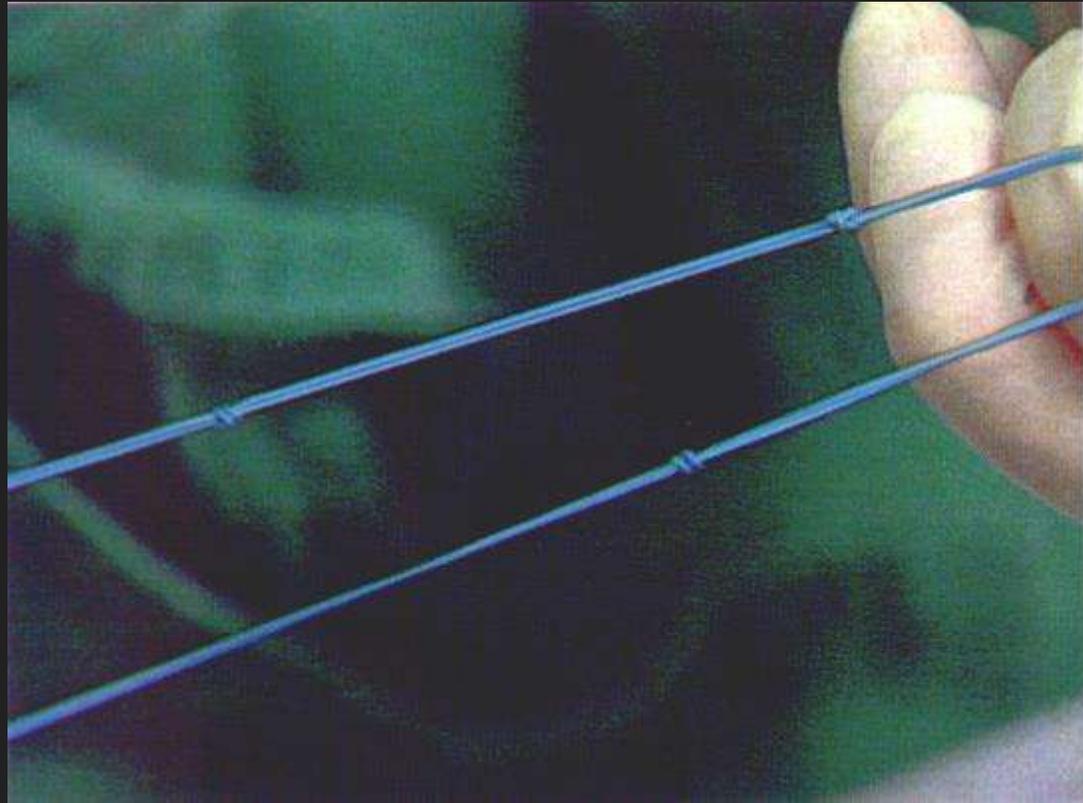
缝织段长15mm

针距2mm



将所取骨膜缝合于肌腱的股骨端

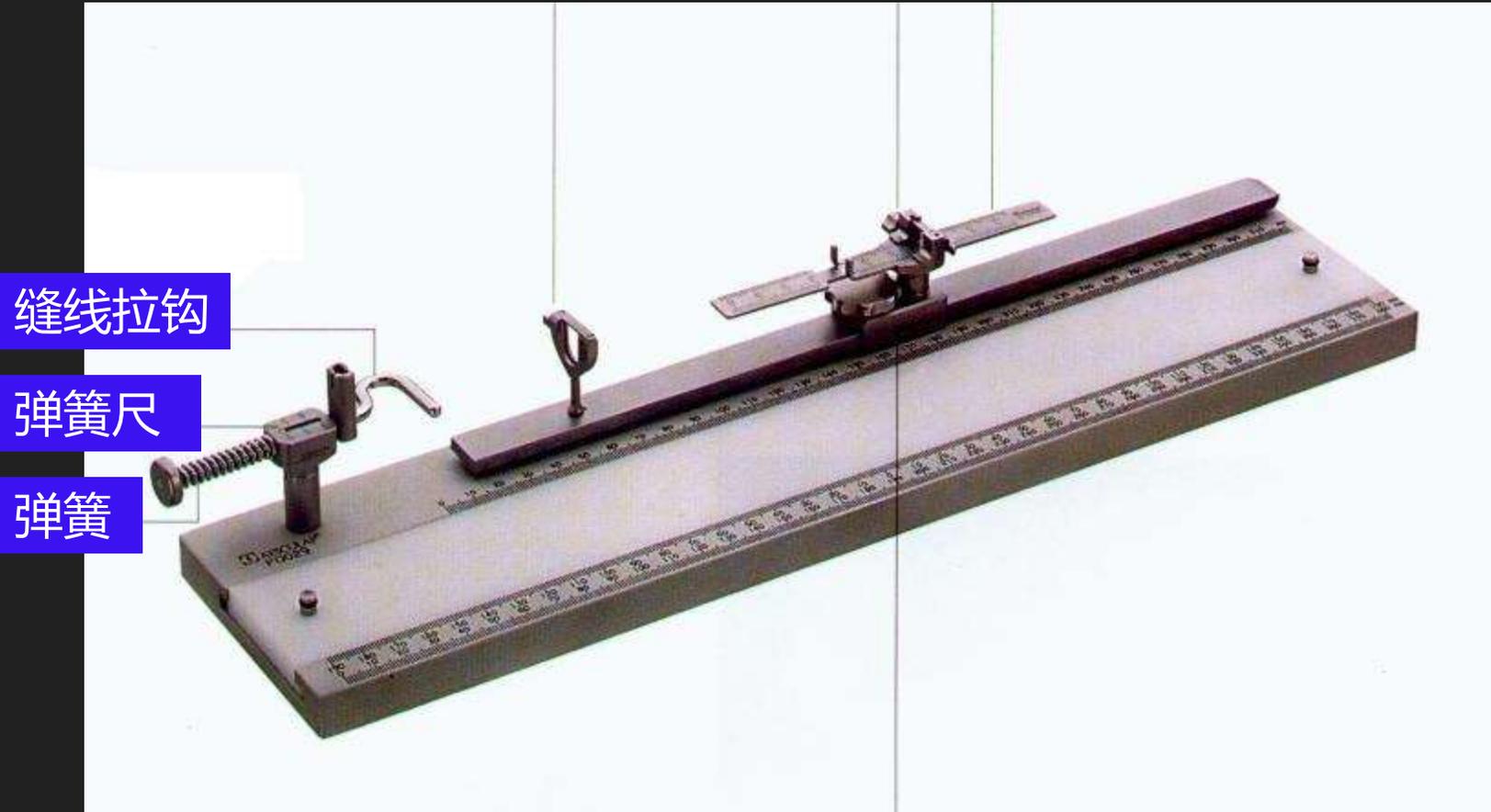




**四束法时，粗的肌腱段两断打一个结，
细的肌腱段两断打两个结**

肌腱预牵张

缝线纽扣夹持器 缝线钢板夹持器和聚乙烯带测控尺



缝线拉钩

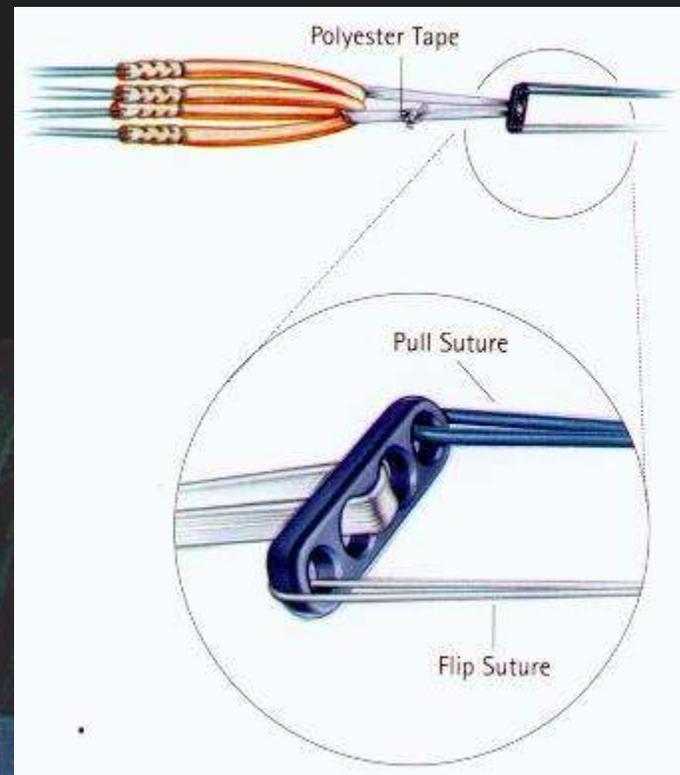
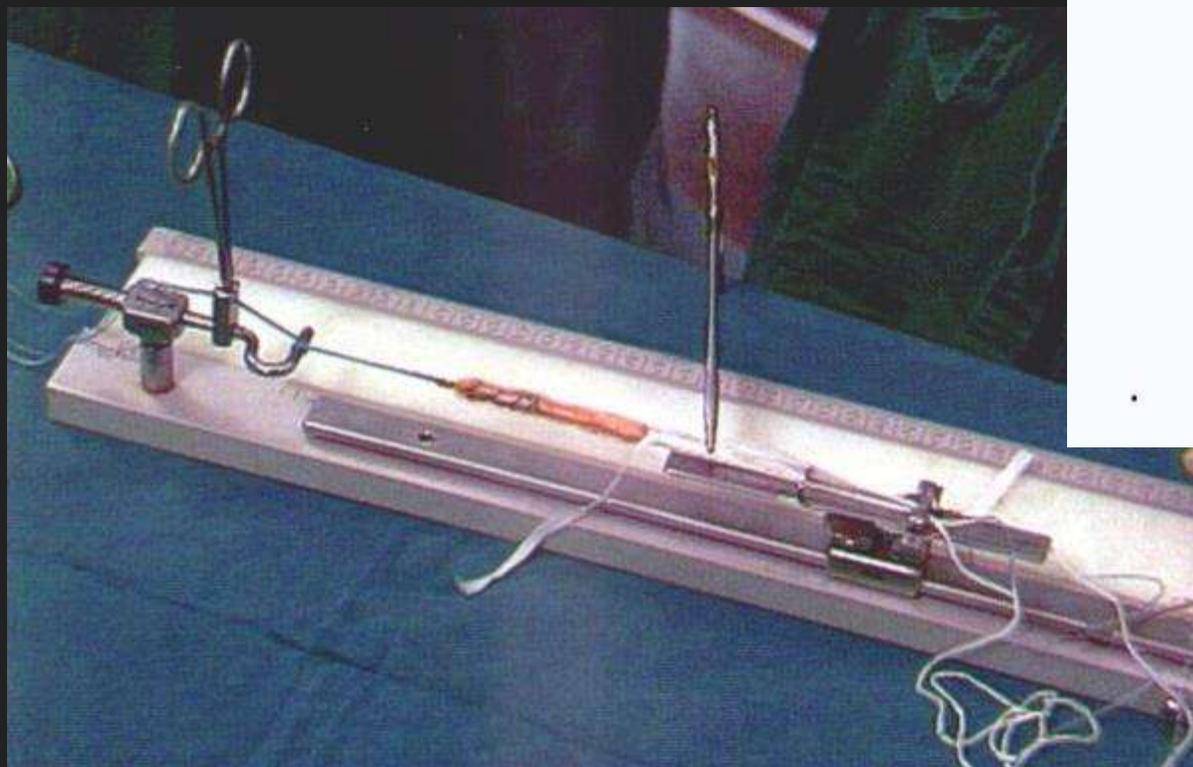
弹簧尺

弹簧

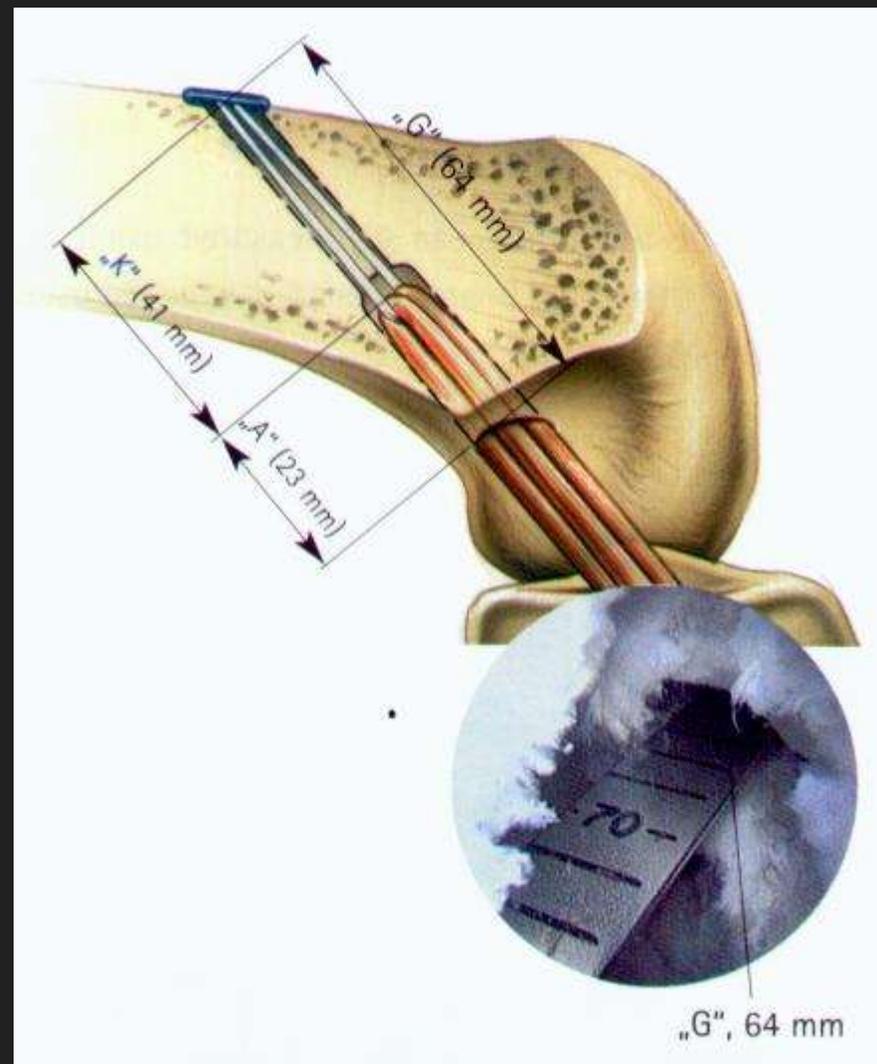
导规滑动装置

肌腱预牵张——移植物的固定

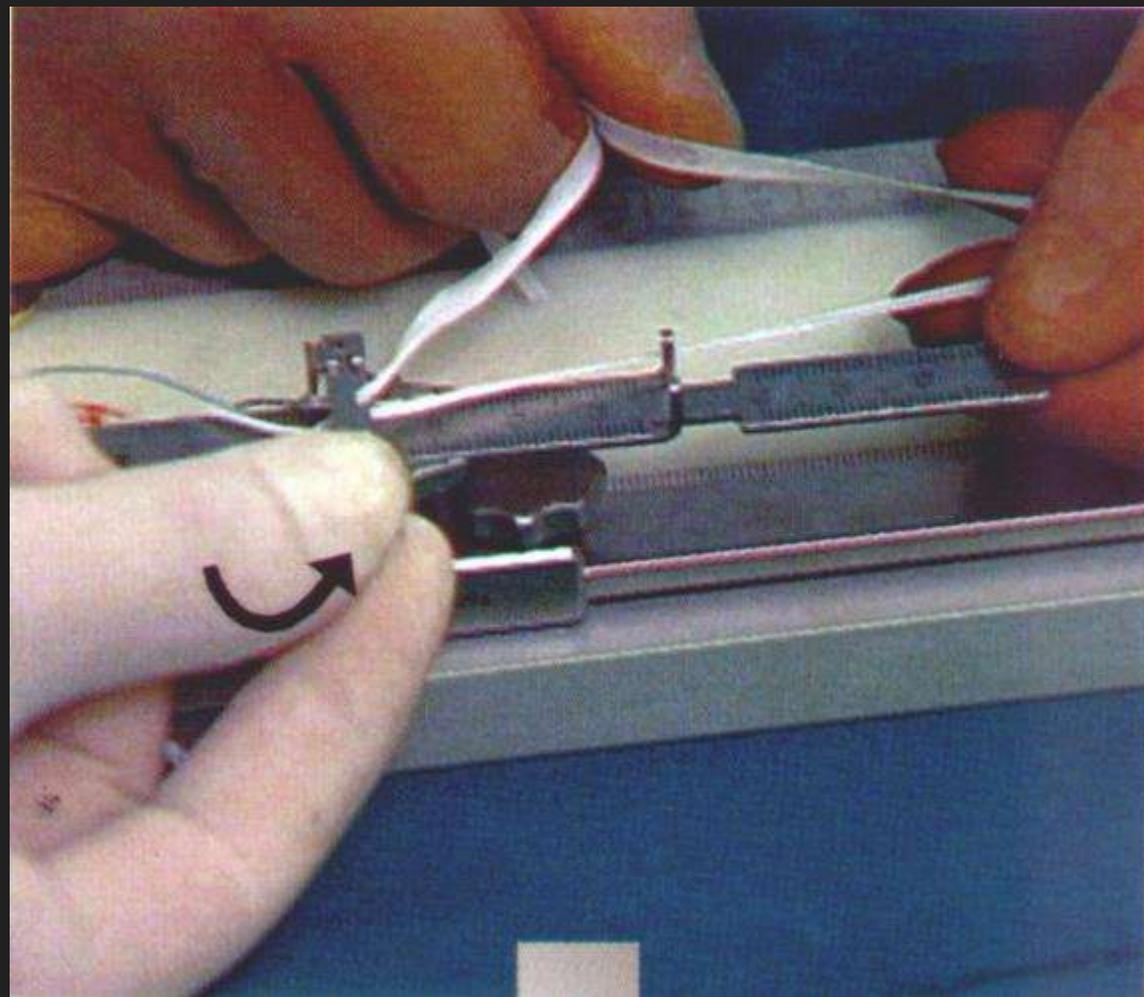
牵张力60-80牛顿，
时间至少5分钟



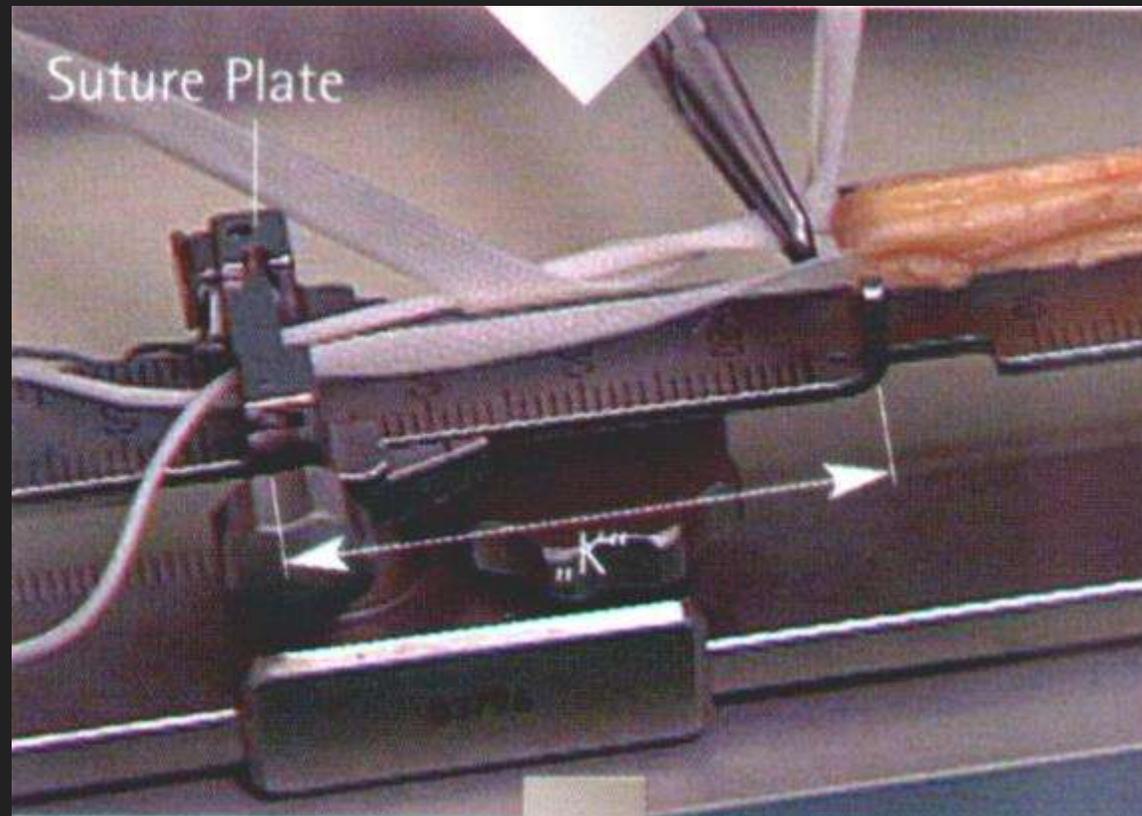
根据股骨隧道深度测定
聚乙烯带长度



根据所需
长度调节
测控尺



预张



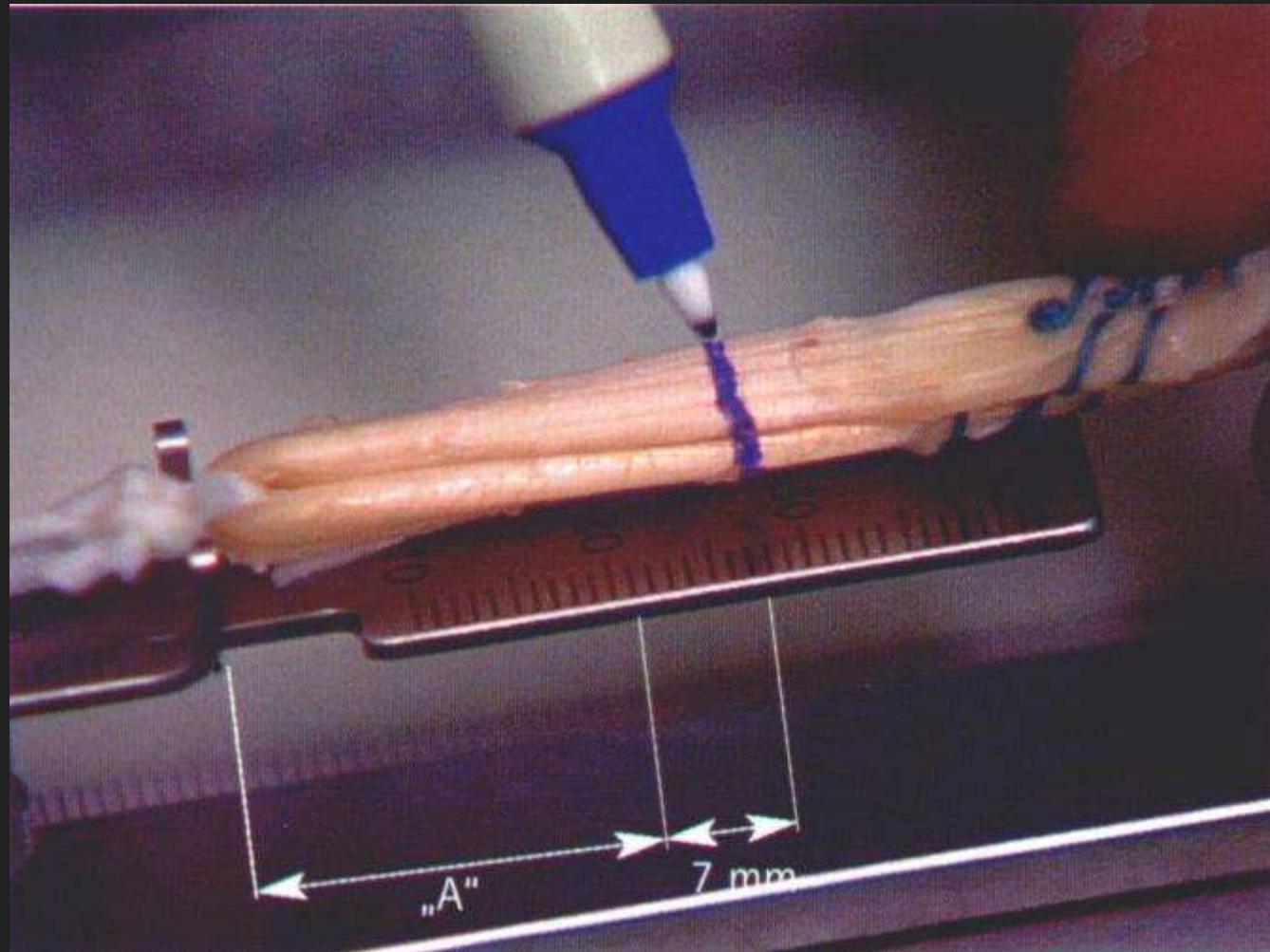
将移植骨端牵拉至0刻度位，
聚乙烯带长度即为所需长度（本例为39mm）

聚

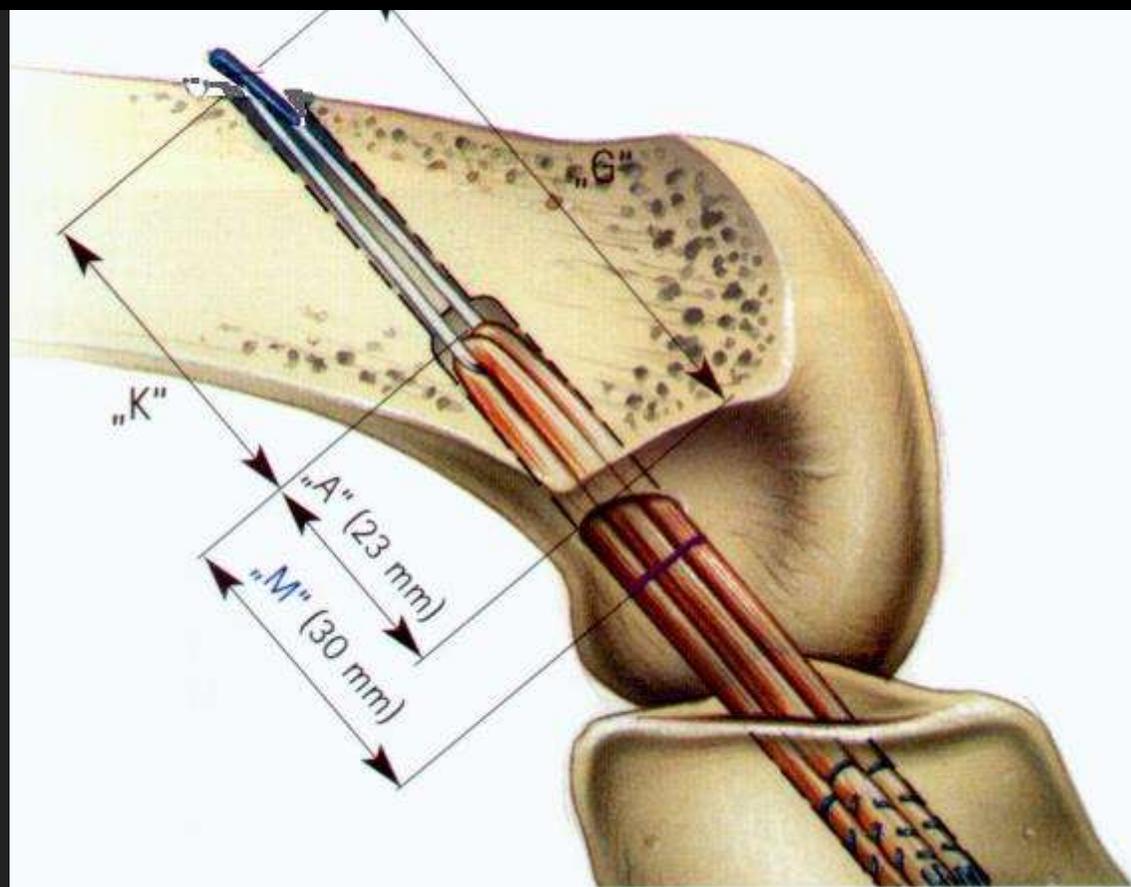
在韧带处于牵张状态下将聚乙烯带打结



股骨隧道内置韧带长度 "A" + 7mm 处做标记

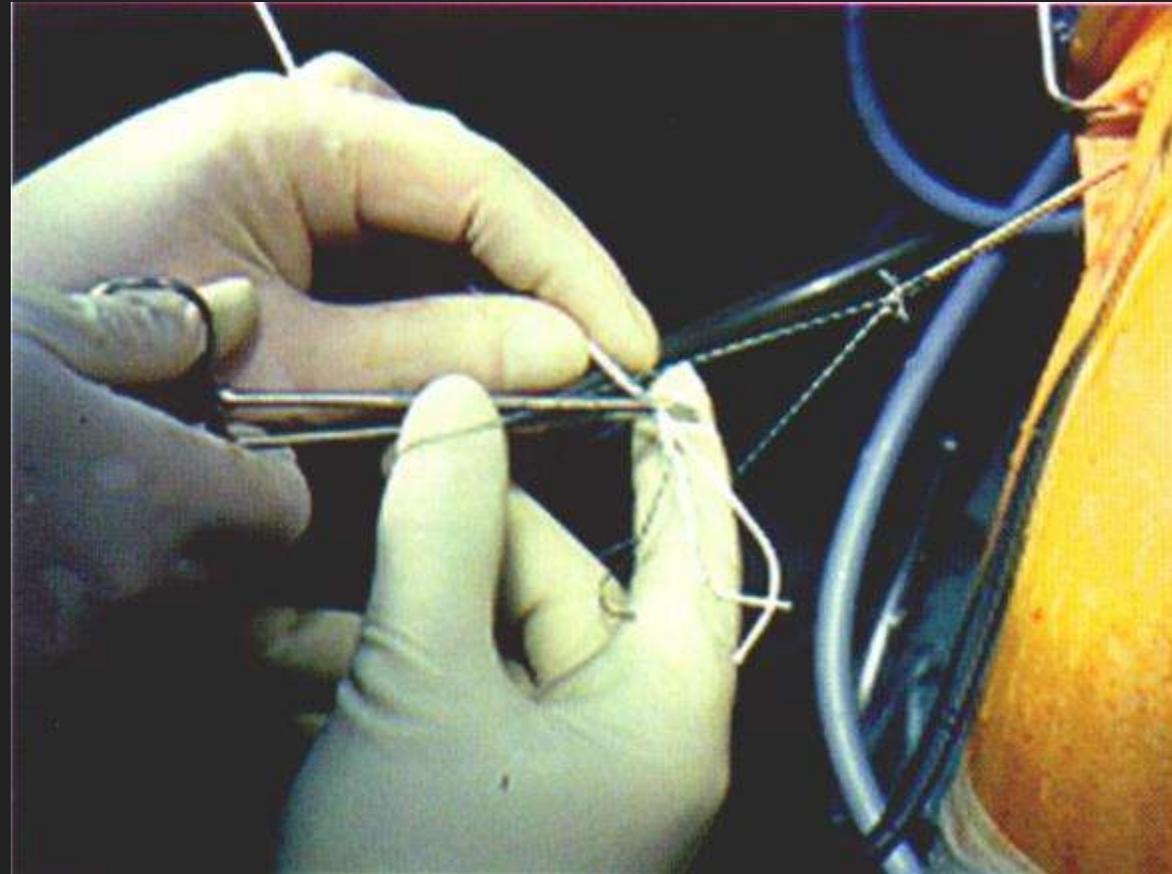


当该标记拉至股骨隧道口时，
提示可以翻转缝线钢板

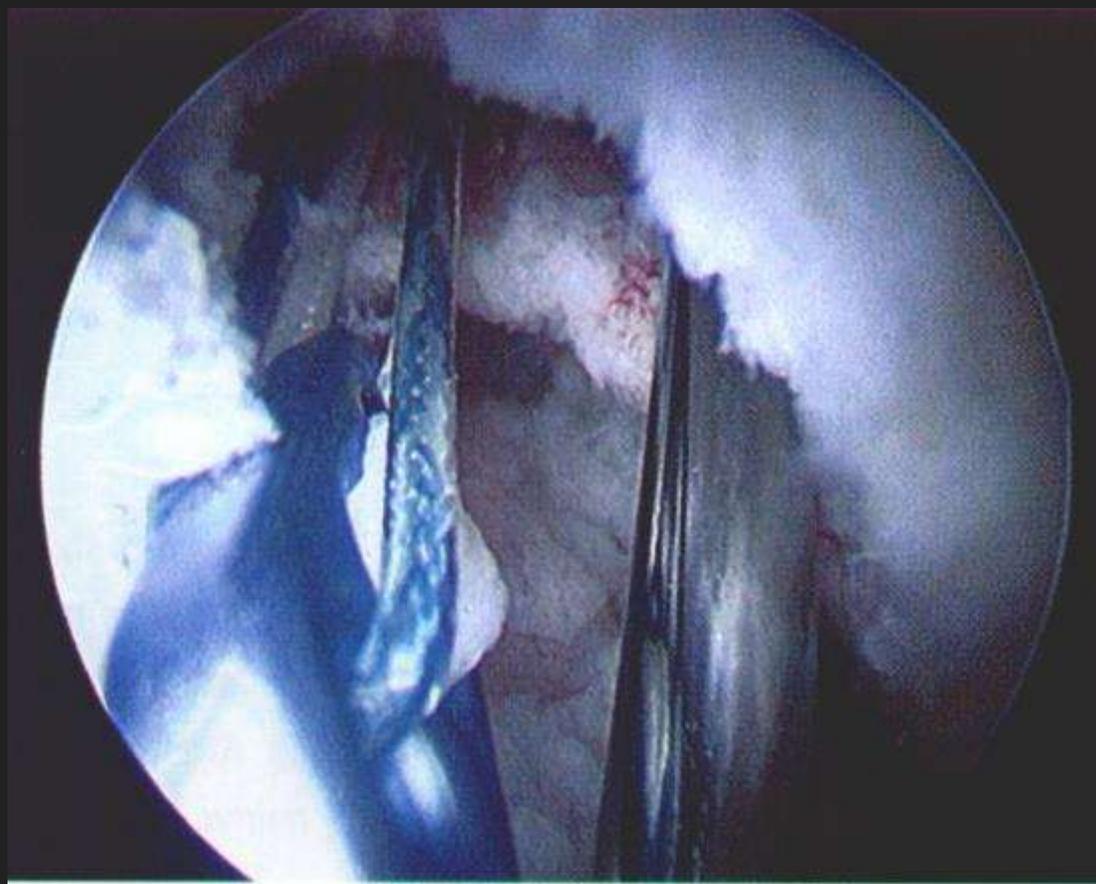


韧带的拉入和固定

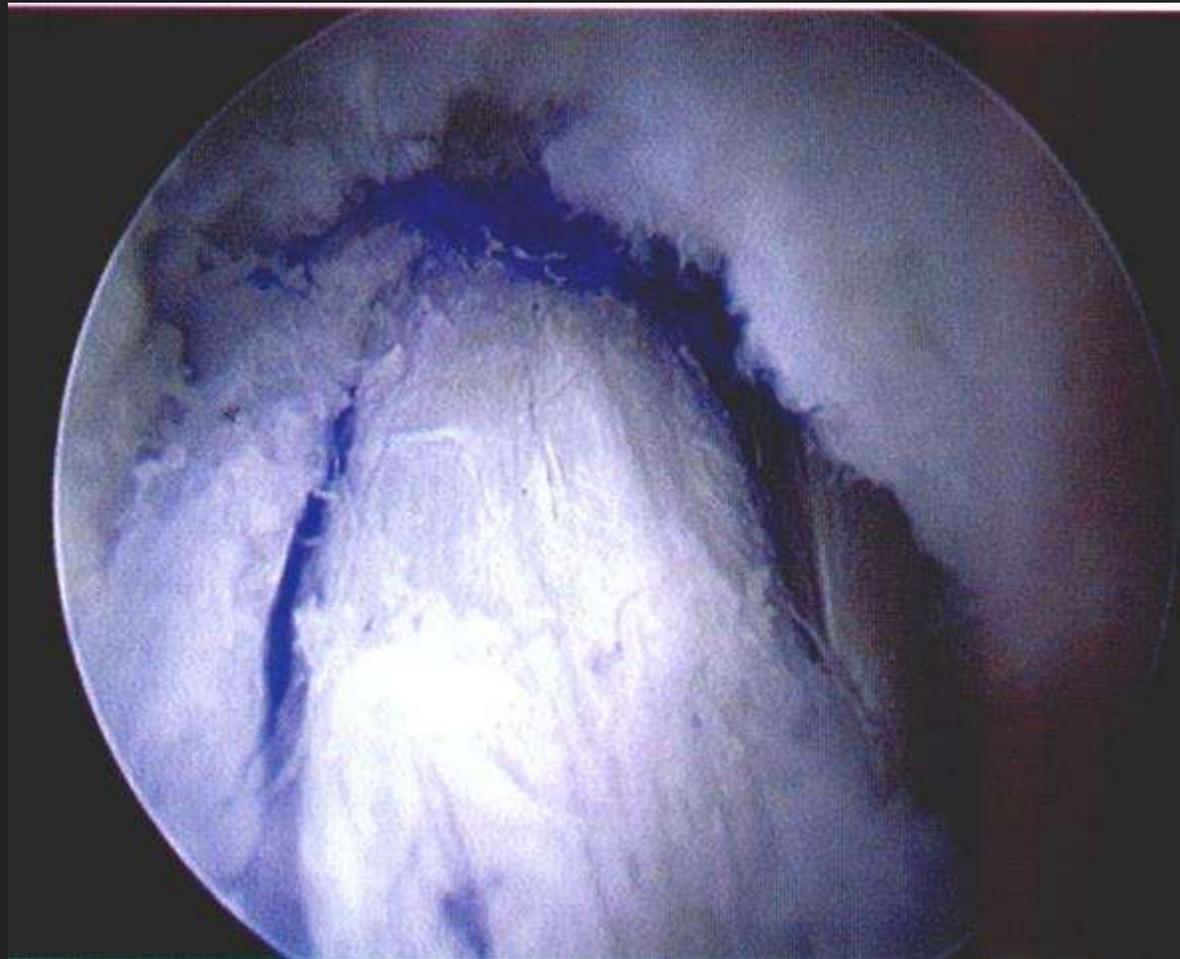
将韧带股骨端的牵引线和翻转线
穿入导针尾孔或者连接于尾孔的线套内



**导针经骨隧道置入，穿大腿皮肤拉出。
通过牵引线将植入物拉入**

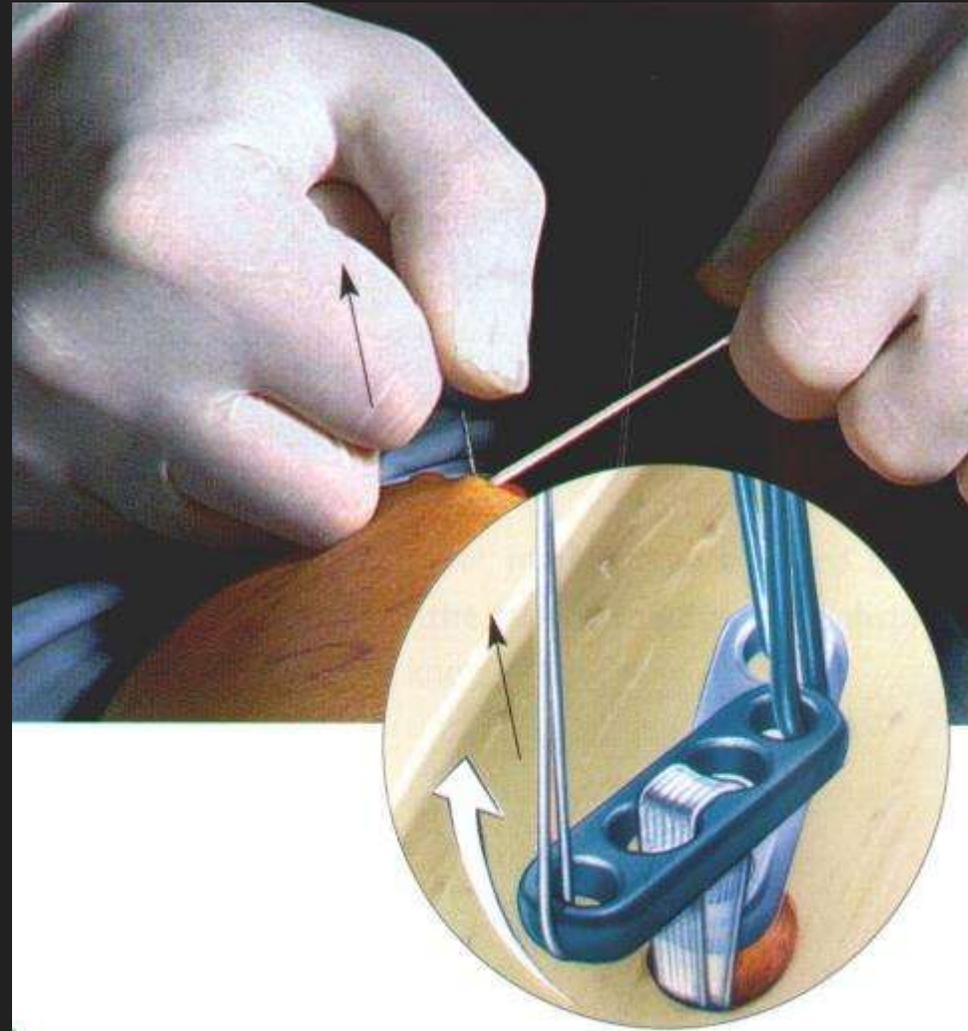


向股骨隧道内牵拉植入物至标记处

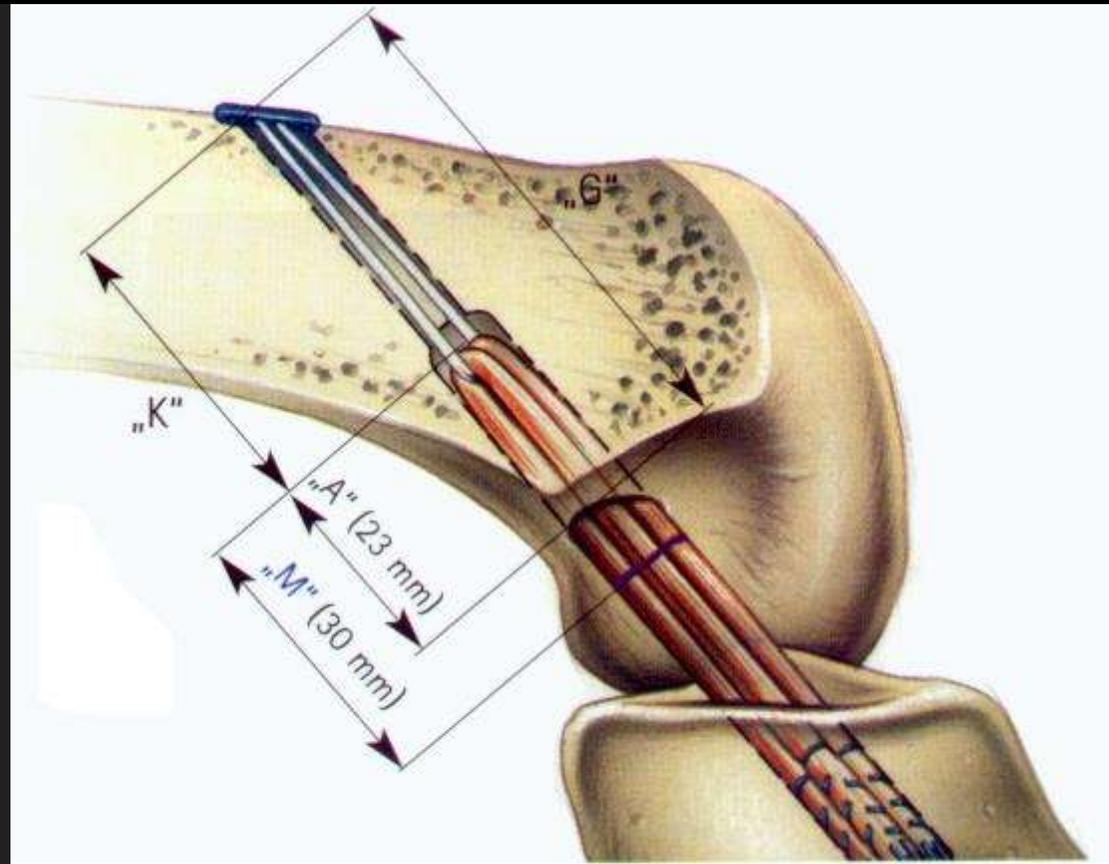


韧带的拉入和固定

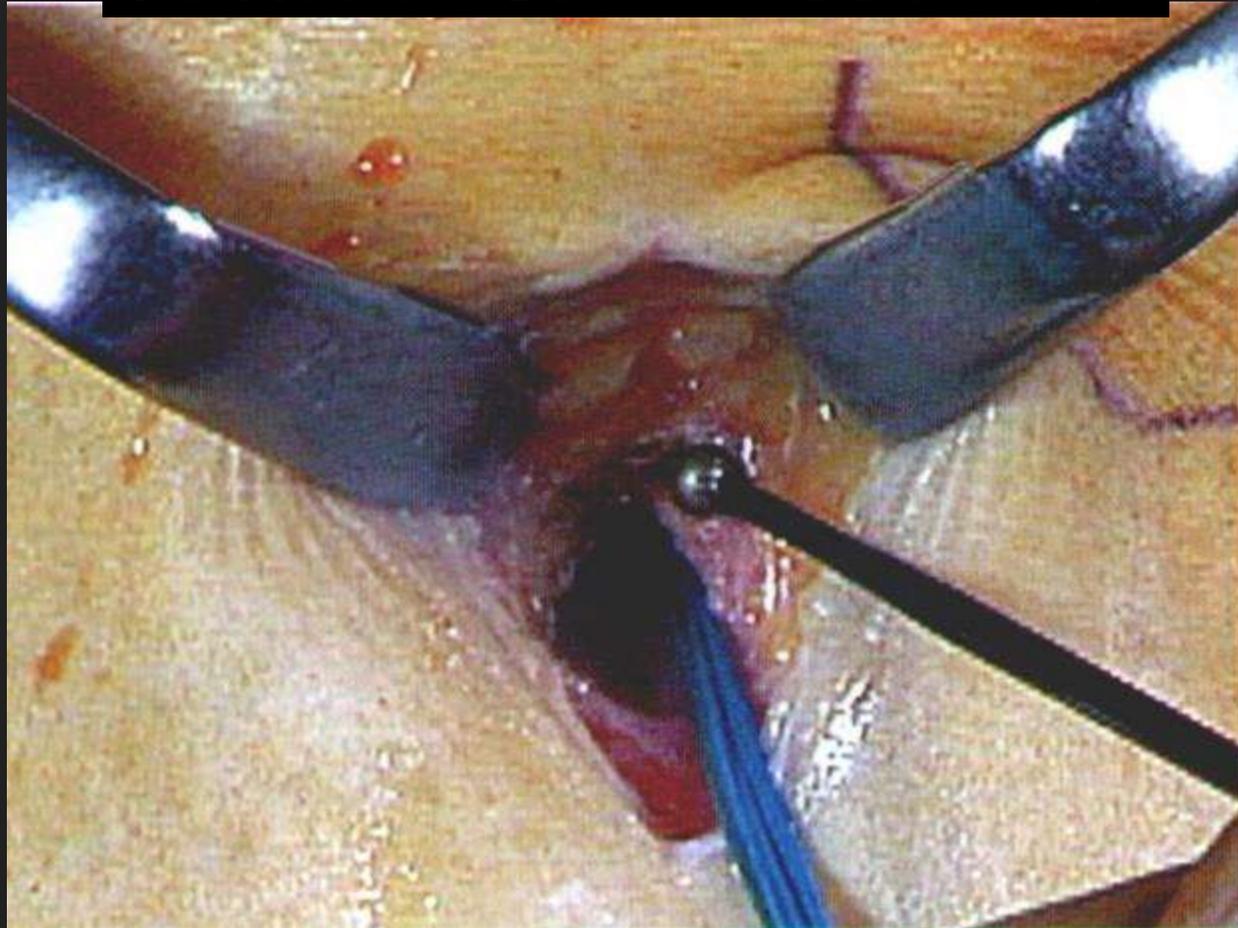
牵拉翻转线，
翻转缝线钢板



回拉植入物，股骨端即得到固定，
标记线回入关节腔7mm

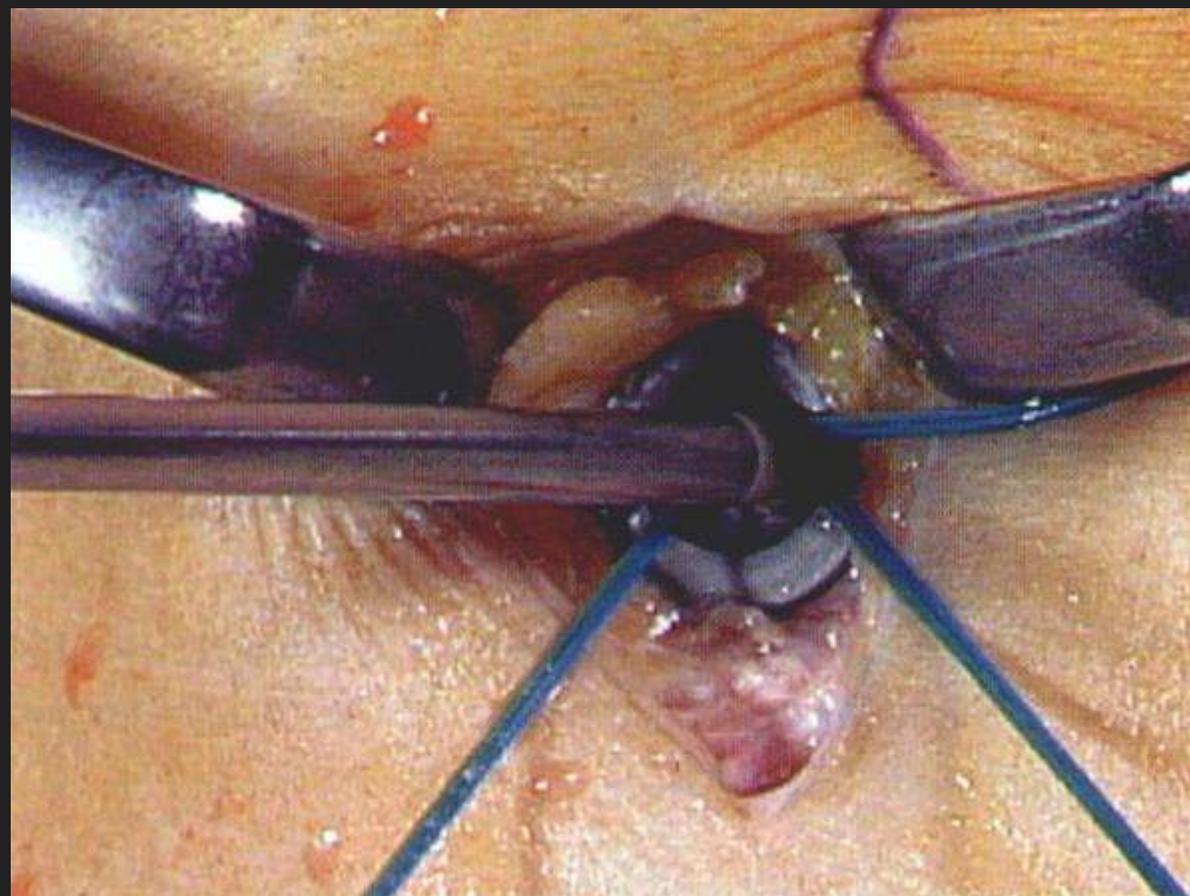


**在胫骨端固定之前
需清除胫骨隧道口的软组织**

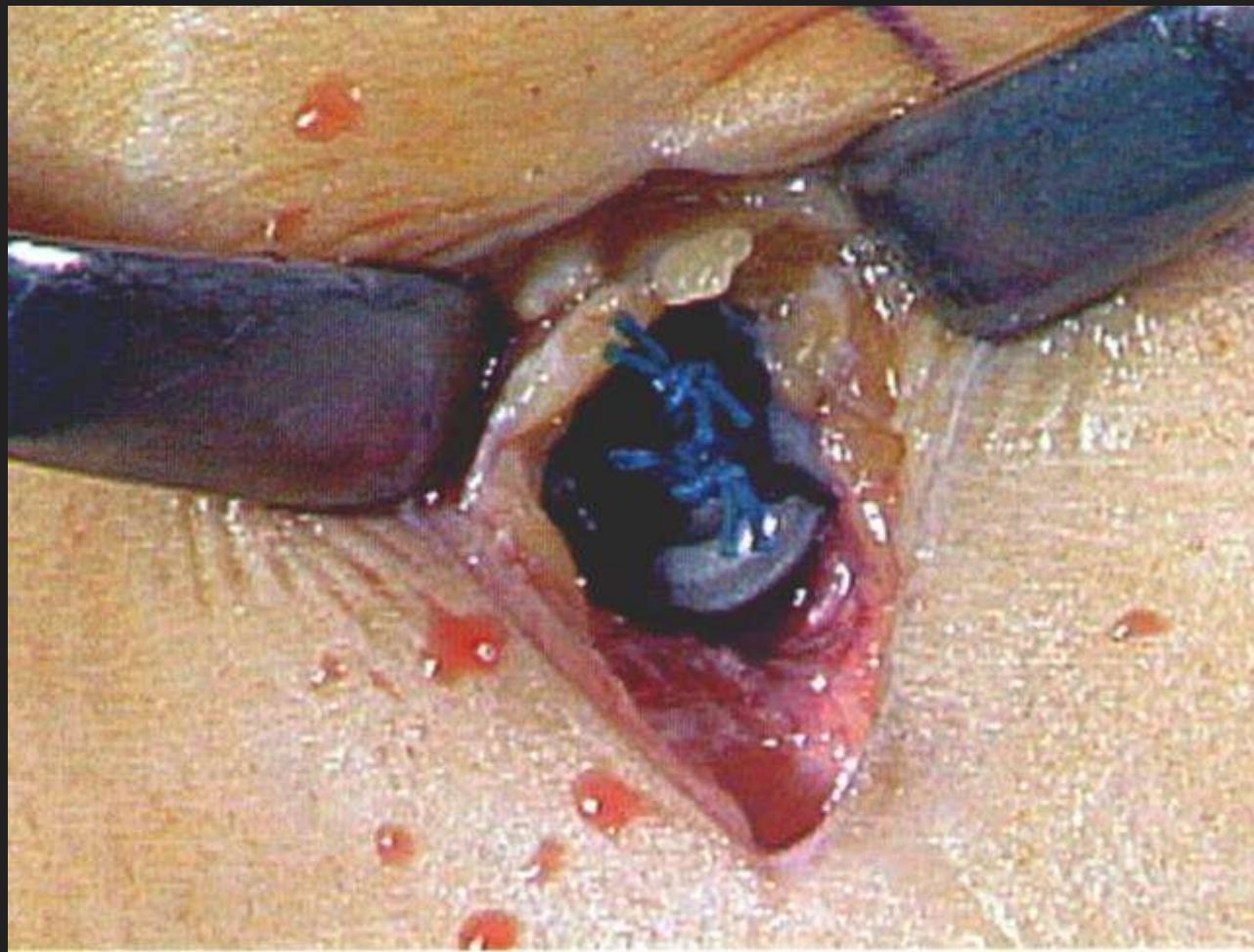


固定

**胫骨端带单结的缝线在屈膝40°位打紧，
带双结的缝线在接近伸膝位打紧**



固定完毕

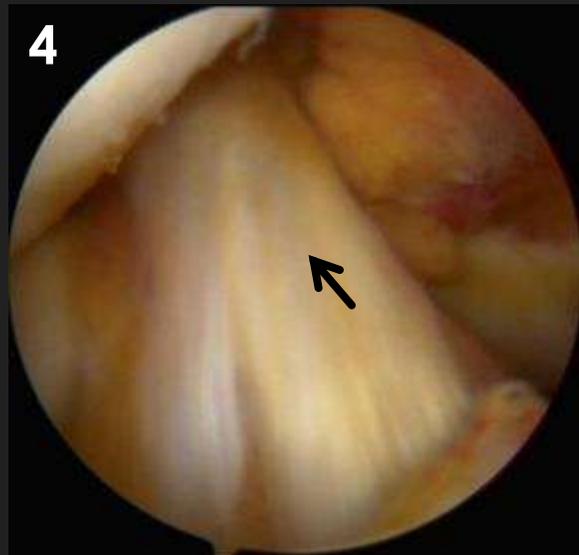
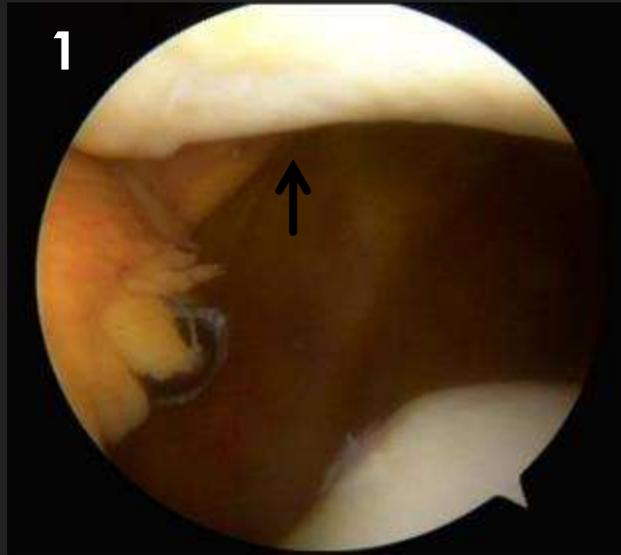


半腱肌重建前交叉韧带的优点

- 切口小、美观
- 对伸膝装置无干扰
- 四束肌腱的血液供应好
- 移植物弹性模量同前交叉韧带类似
- 可同时重建前内侧束和后外侧束



关节镜下探查



Thank You!

The image features the text "Thank You!" in a bold, 3D, sans-serif font. The letters are a vibrant yellow-orange color with a gradient and a slight shadow, giving them a three-dimensional appearance. The text is slanted upwards from left to right. Behind the word "Thank", there is a blue circular graphic consisting of several concentric, slightly offset rings, creating a glowing or tunnel-like effect. The entire graphic is set against a solid black background.