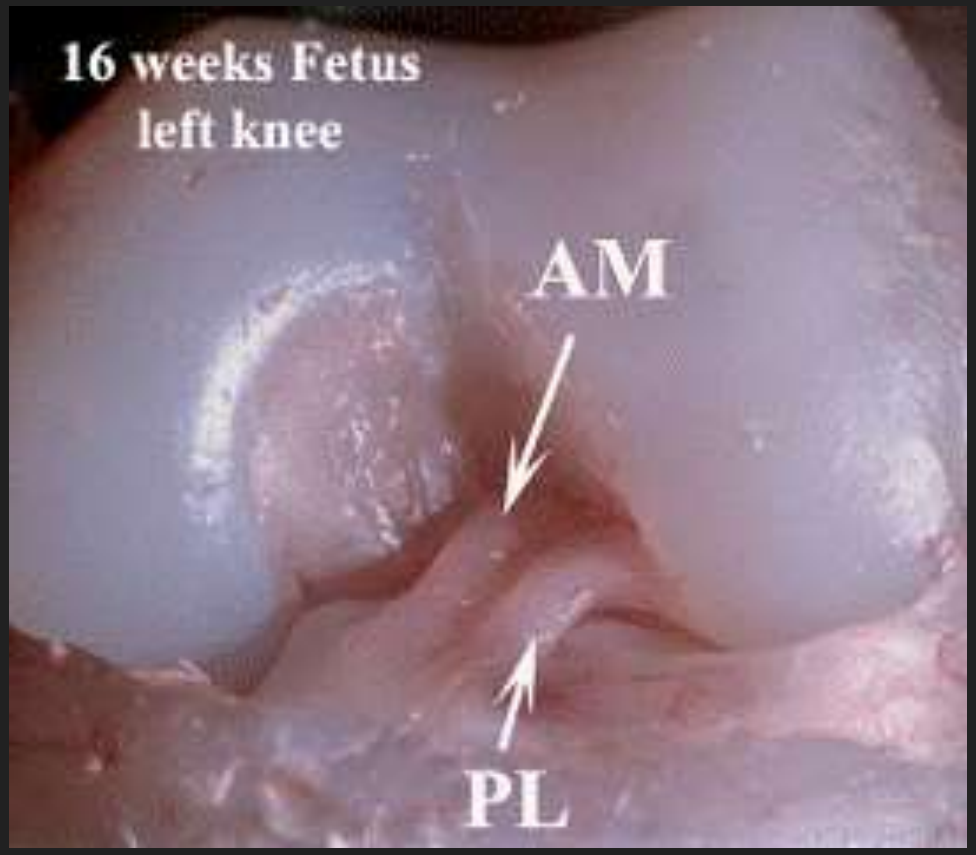
# 前交叉韧带断裂的关节镜微创治疗

赣州市中医院 骨四科

------孙小波

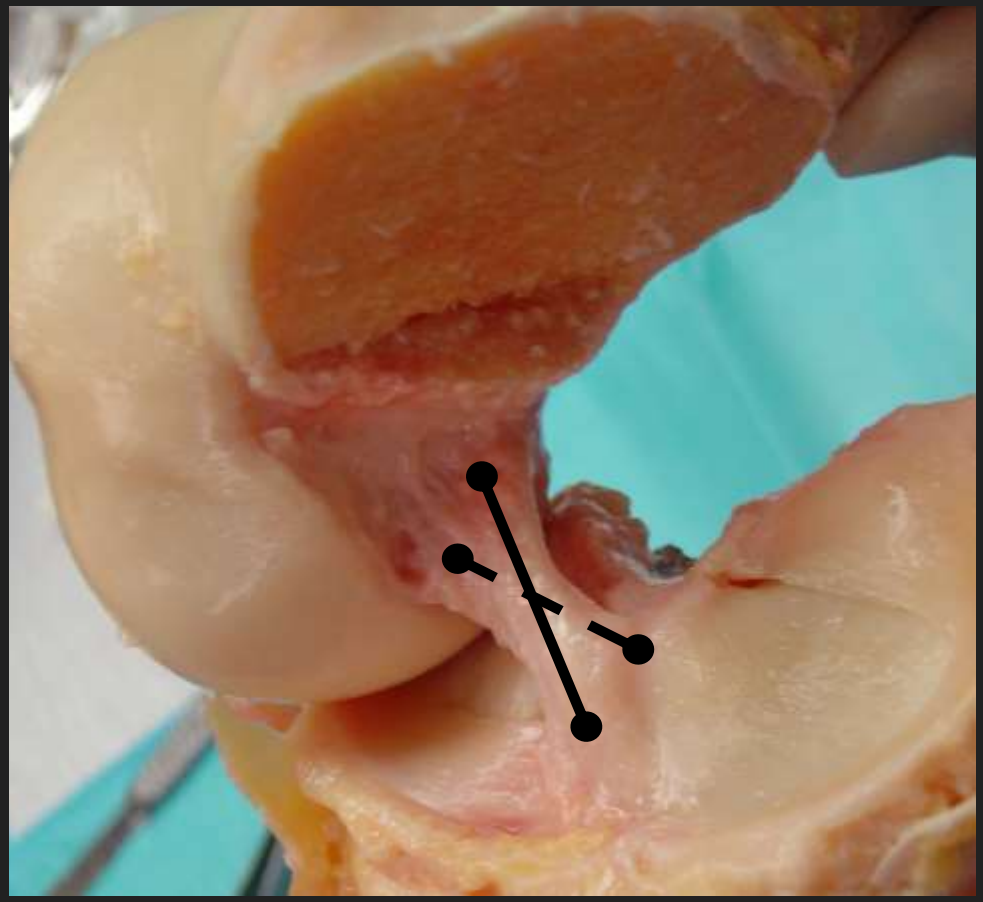
# ACL解剖

- 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



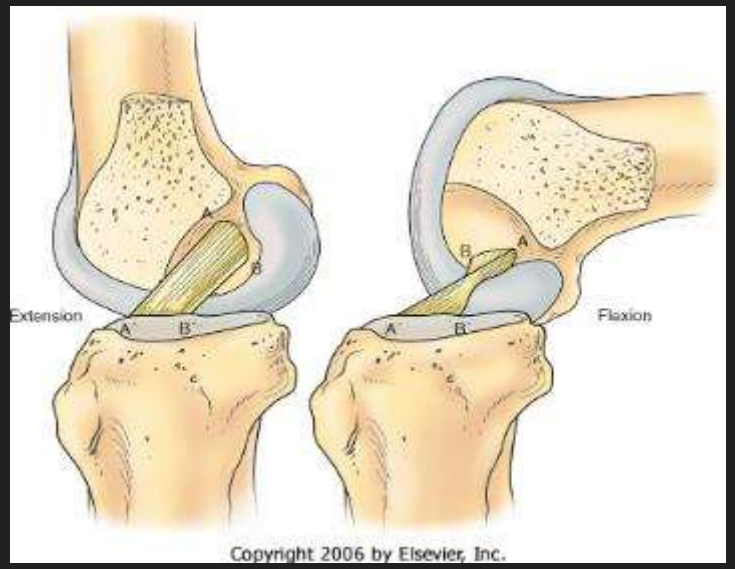
# ACL解剖

- 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：

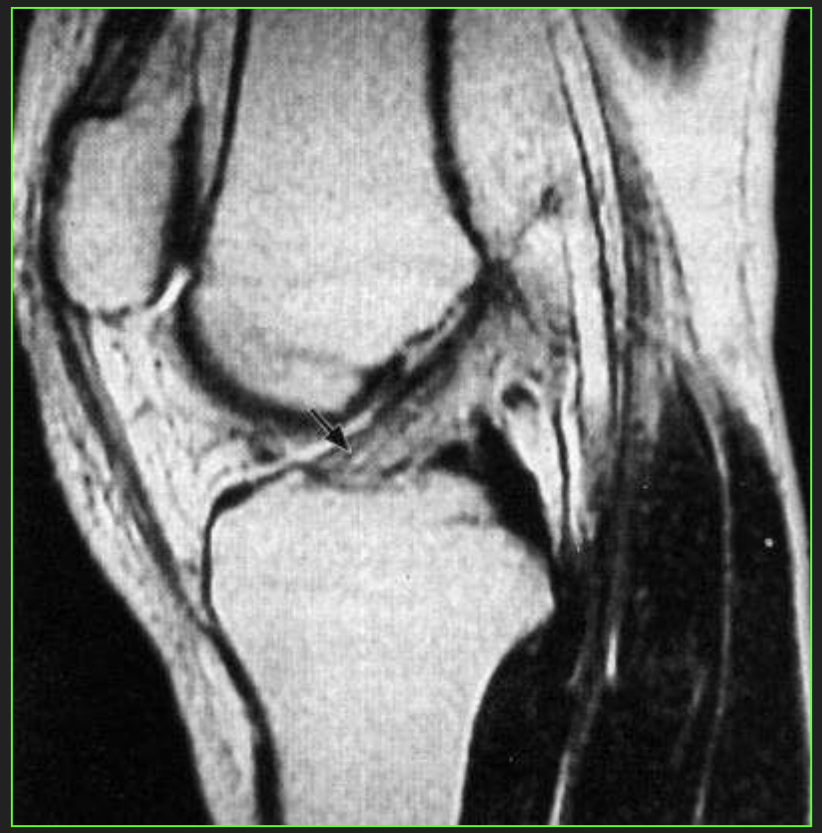
  MRI检查—临床常用检查手段

  KT-2000

  关节镜检查

# 诊断正常前交叉韧带MRI表现

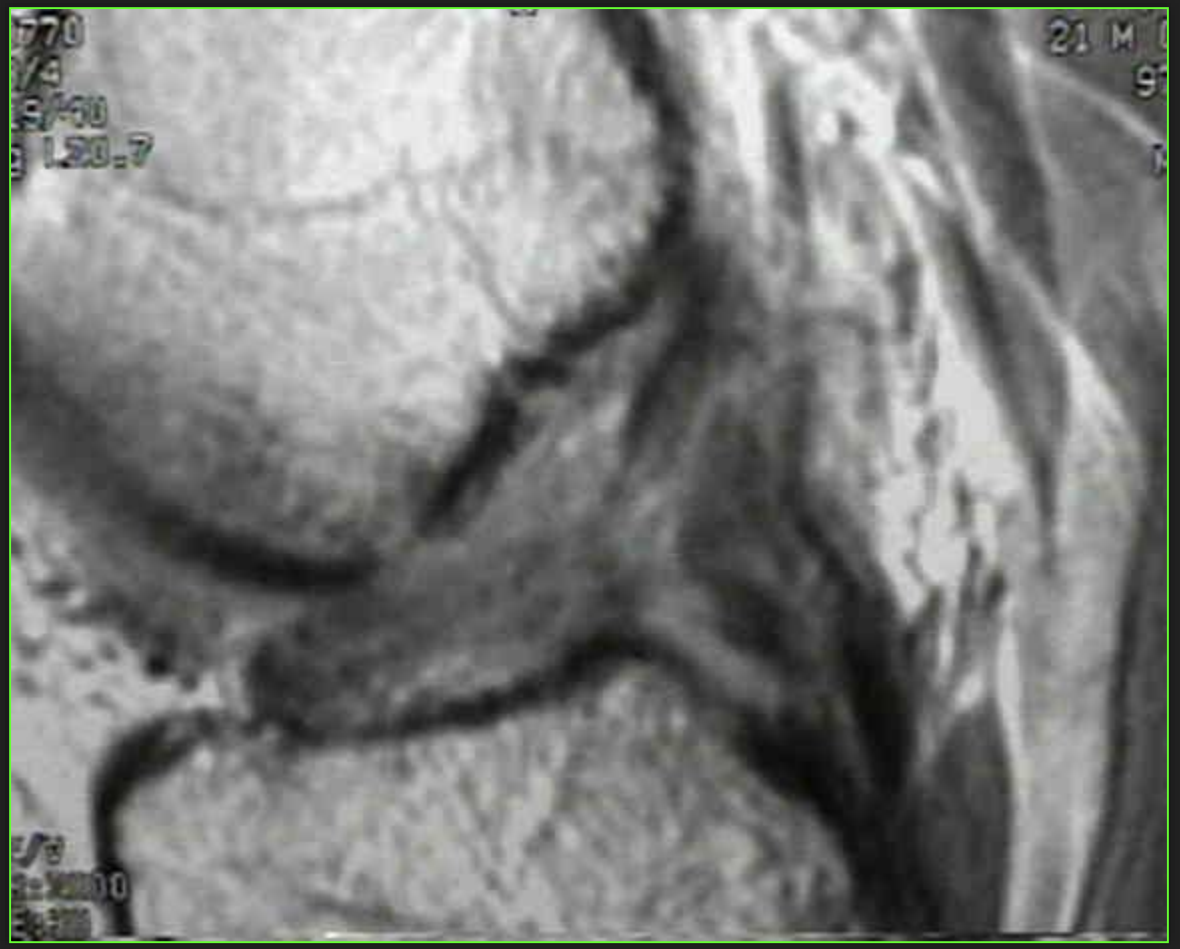
- 在各种序列的MRI图像上，
- 前交叉韧带为一带状的低信号影



# 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：

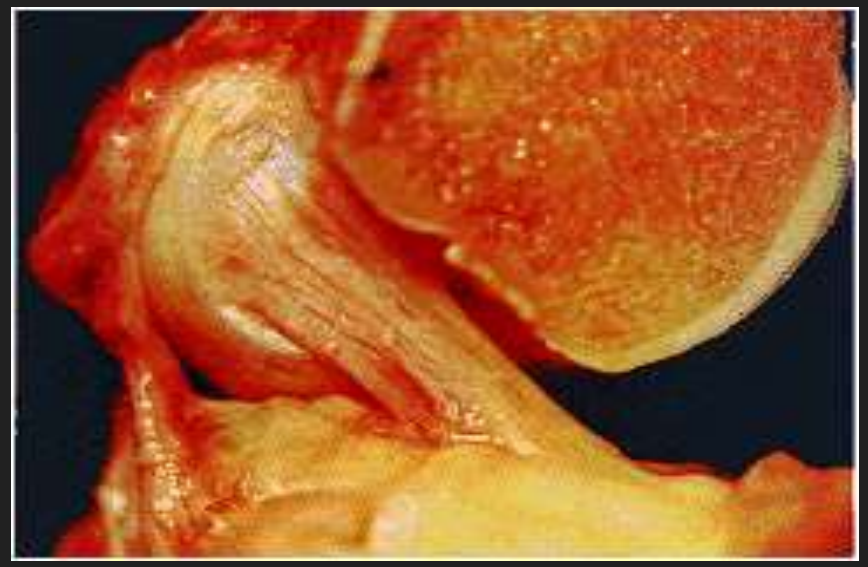
一、半腱肌腱的切取

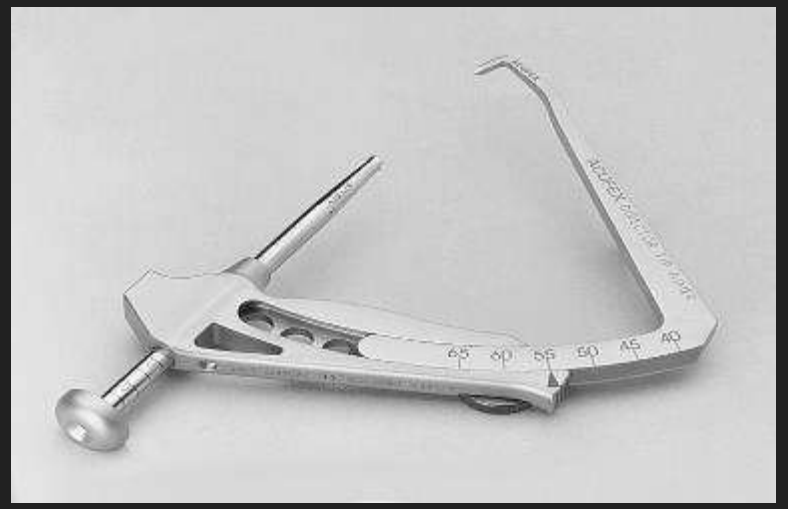
二、骨隧道的建立

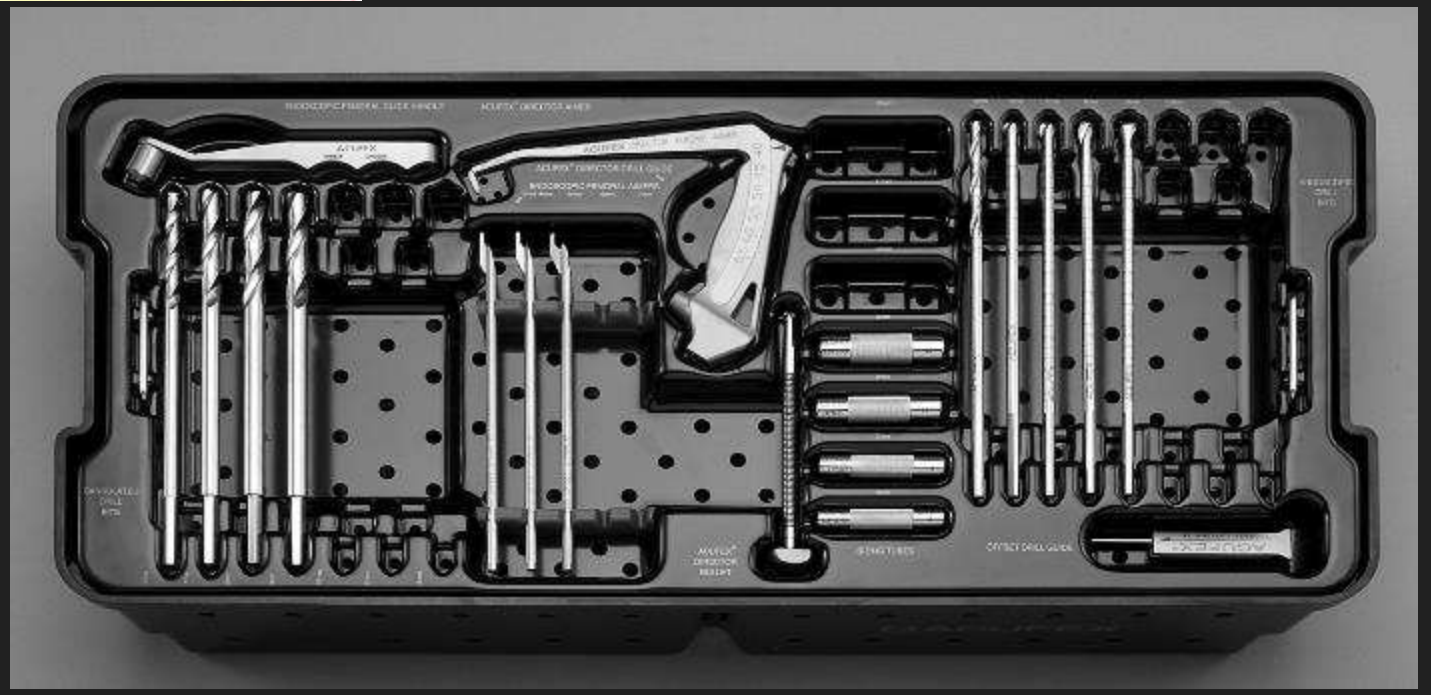
三、半腱肌腱的准备

四、移植物的植入和固定

# ACL Reconstruction

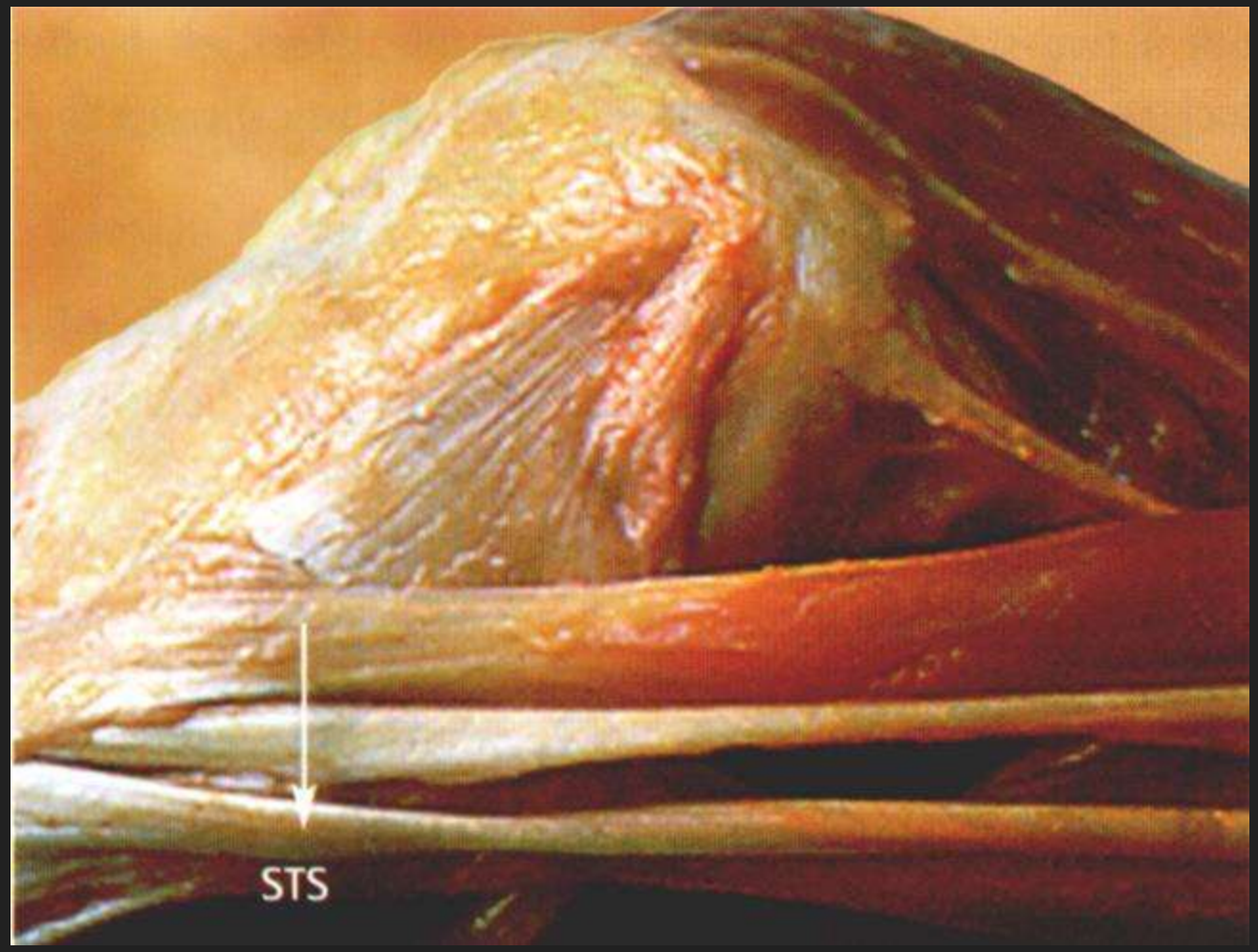






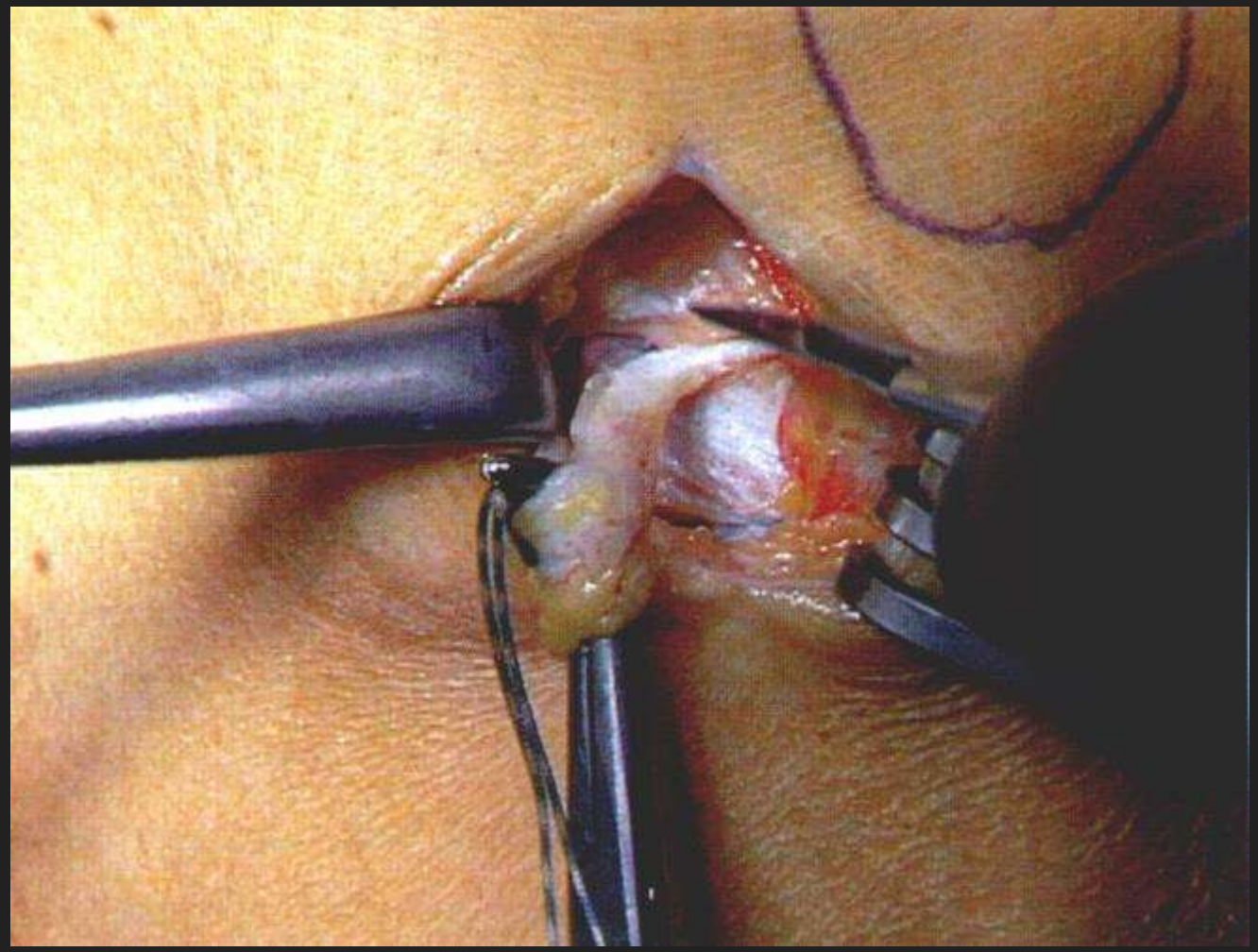
# 手术入路

# 鹅足的组成及排列

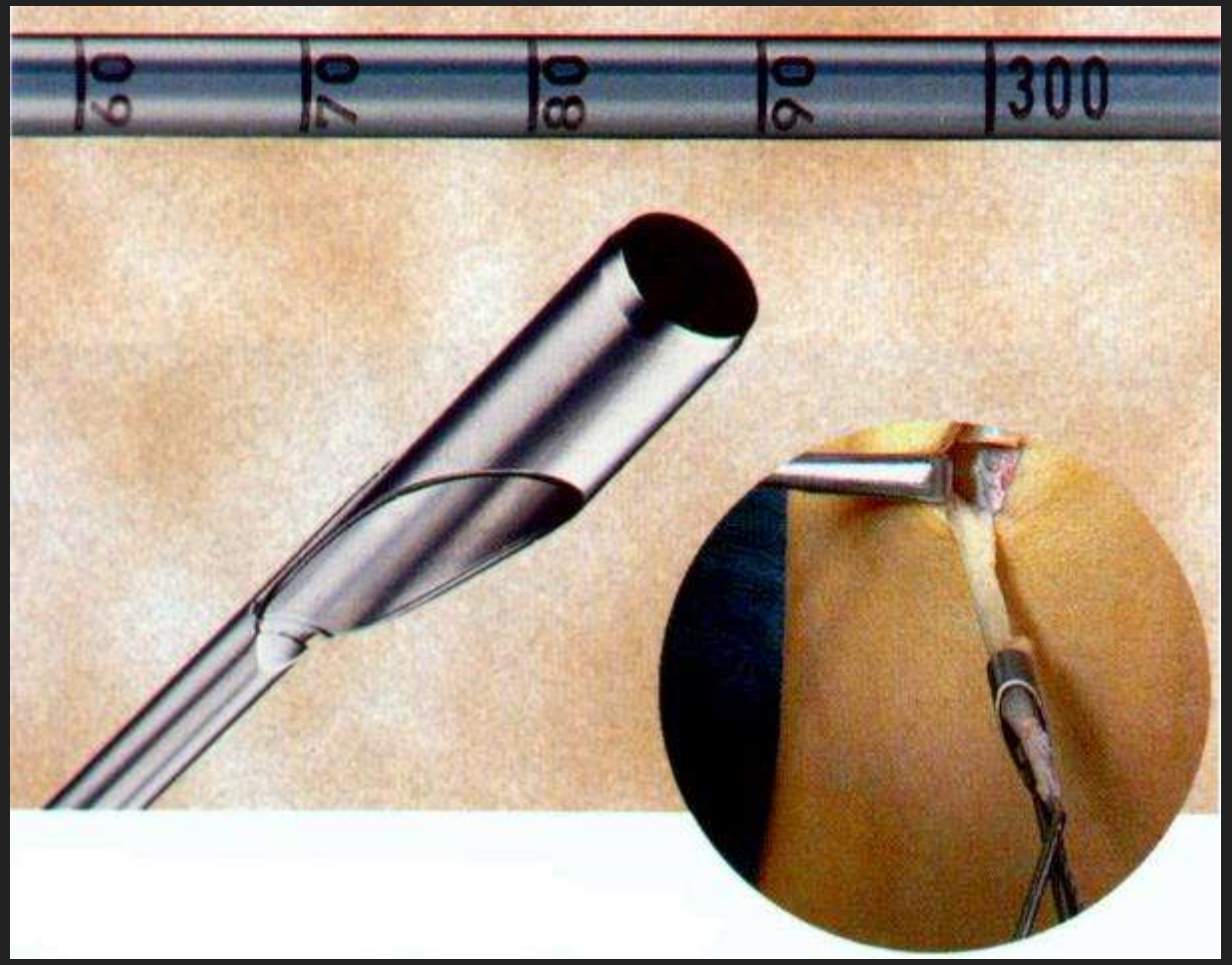


# 找出半腱肌

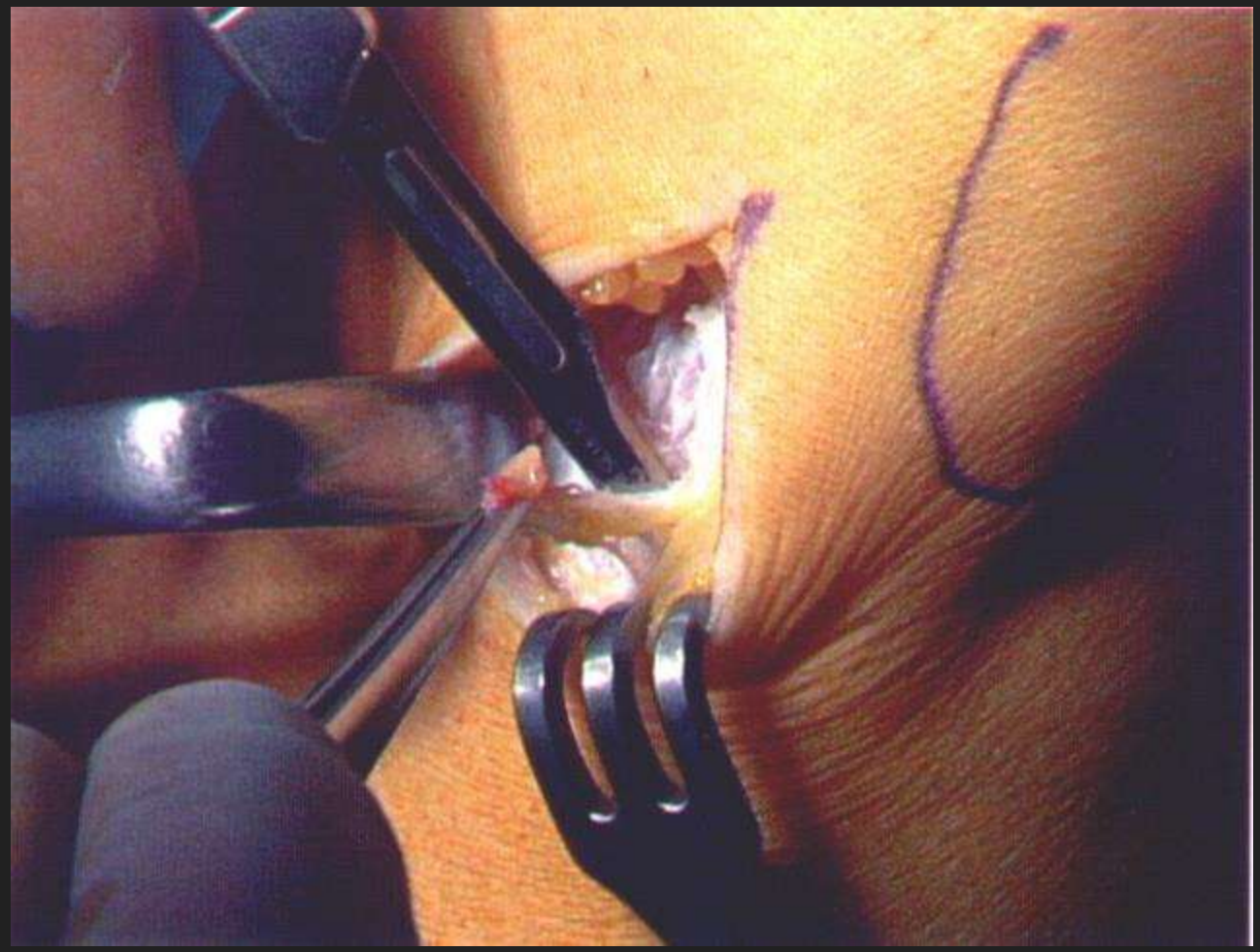
# 在止点部位可多切取约2cm长的骨膜条



# 使用肌腱剥离套管剥取肌腱

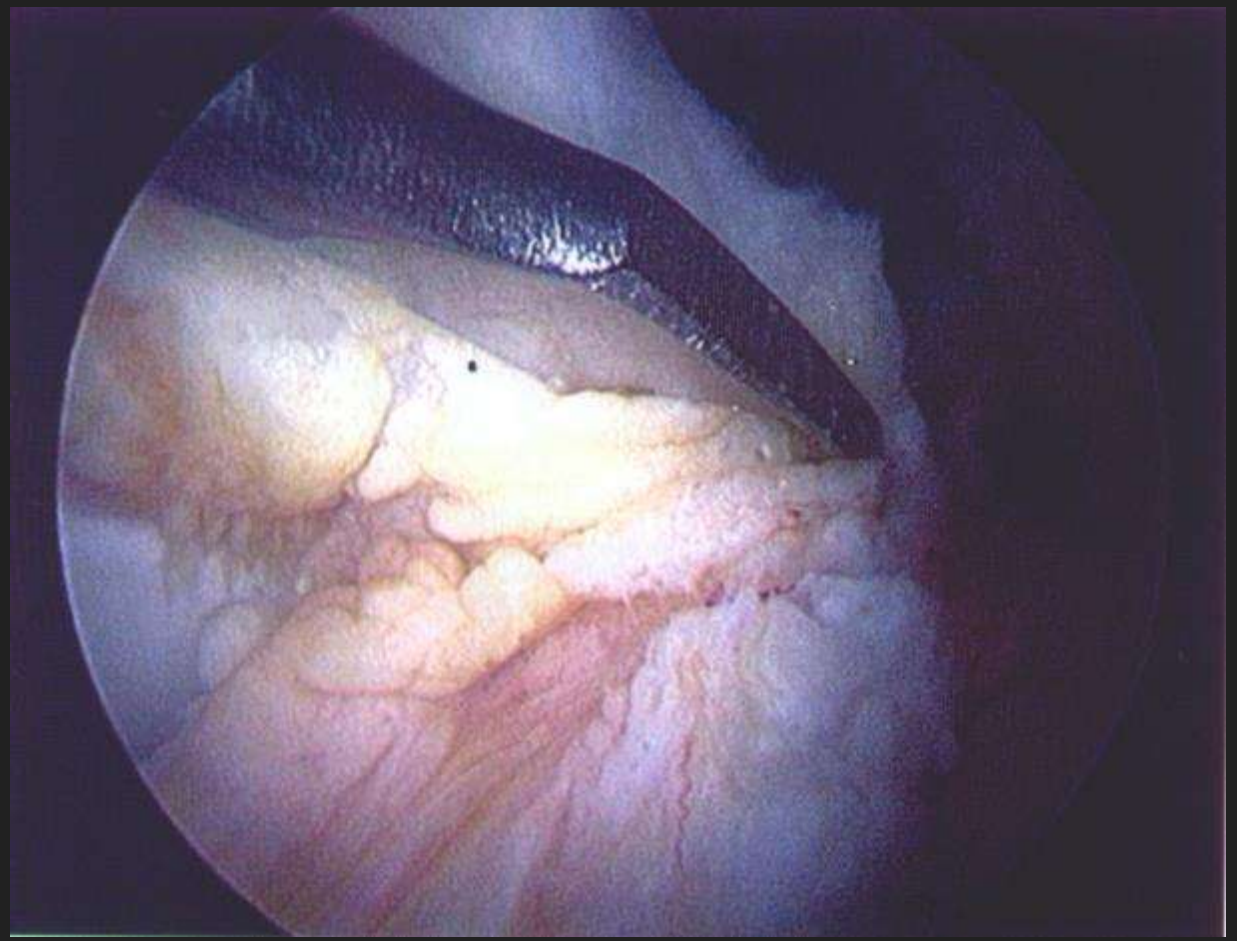


# 最好能于鹅足下切取部分骨膜



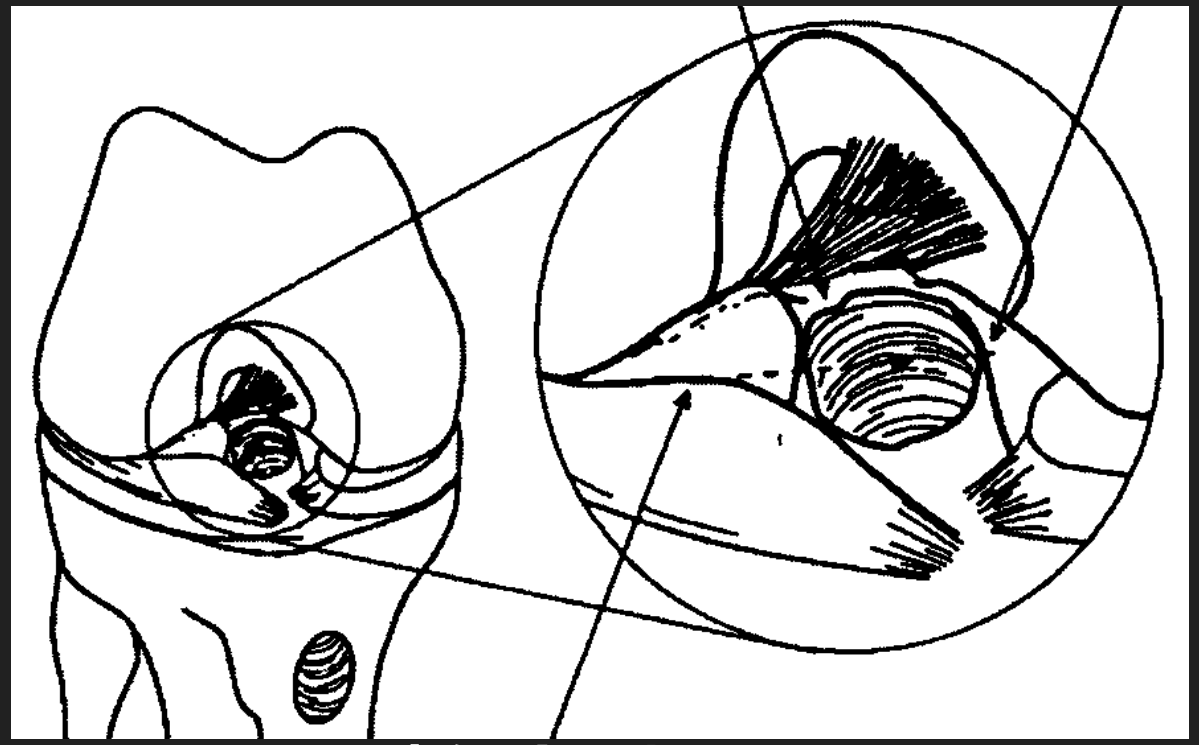
# 骨隧道的建立

## 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

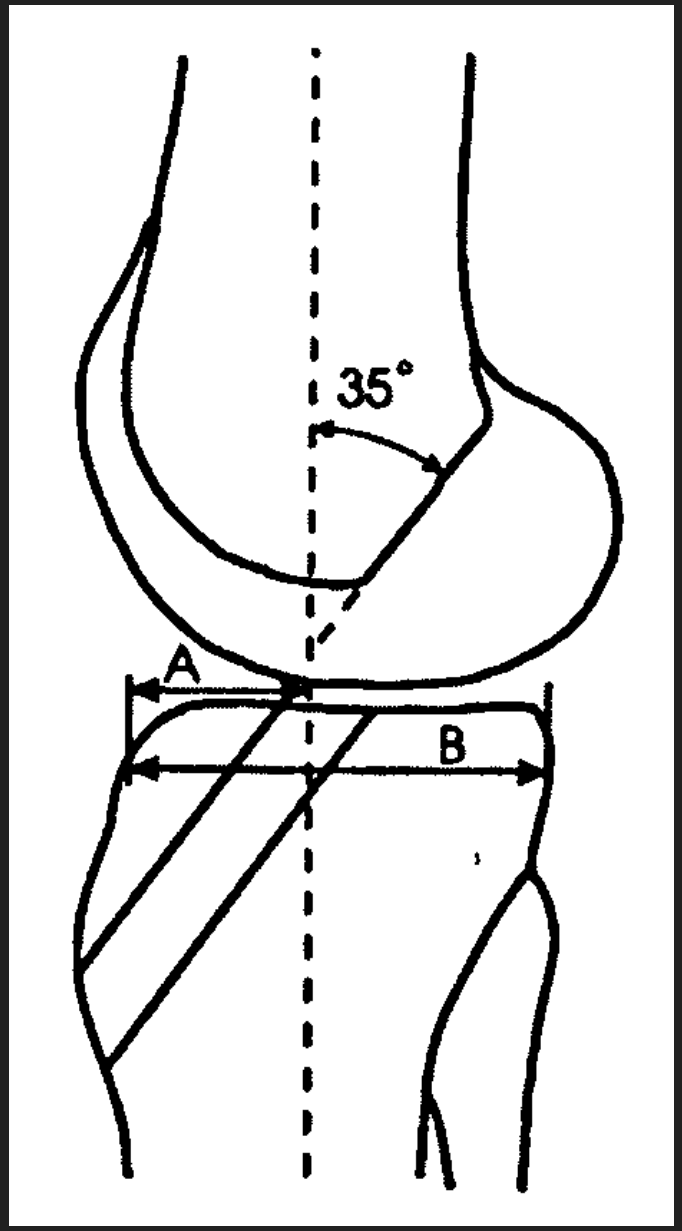
髁间棘顶部　外侧髁间棘



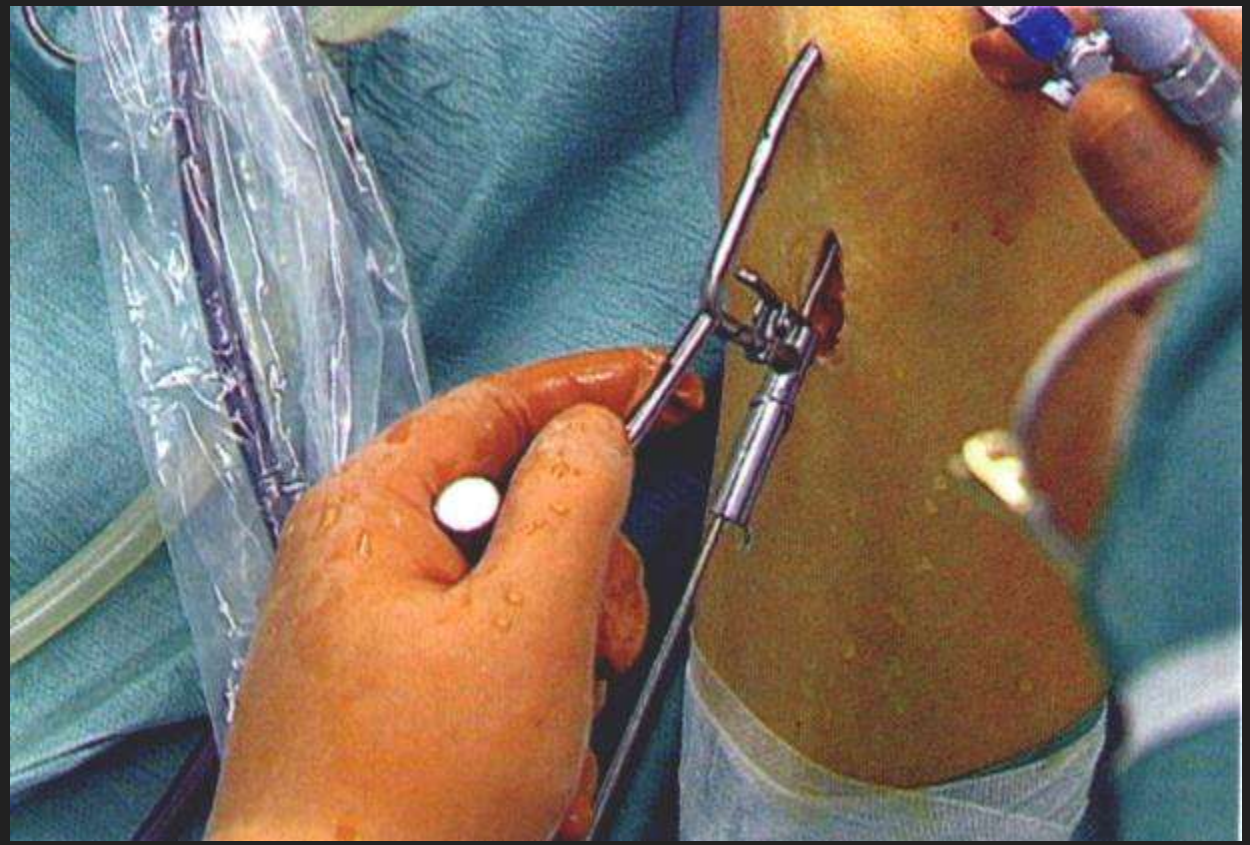
内侧半月板

# 骨隧道的建立

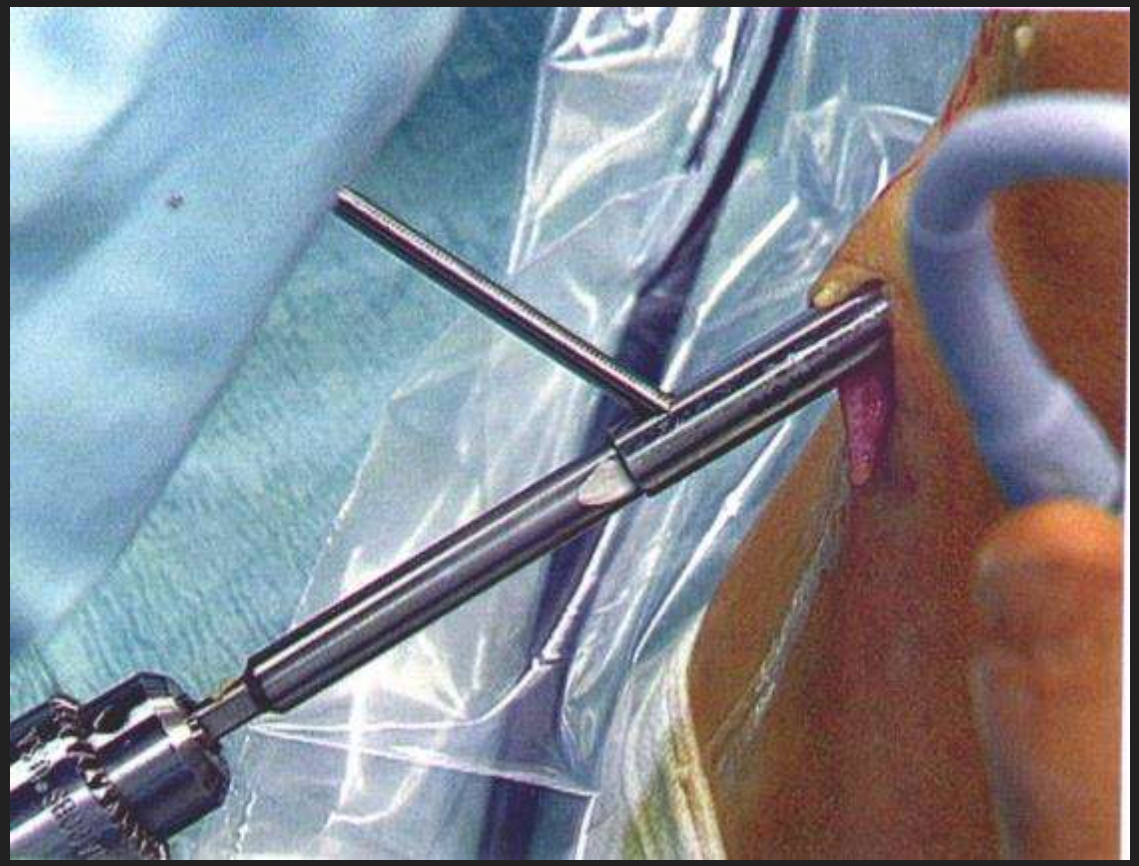
胫骨隧道与胫骨平台面成角50-60°，亦即与胫骨纵轴成角40-50°



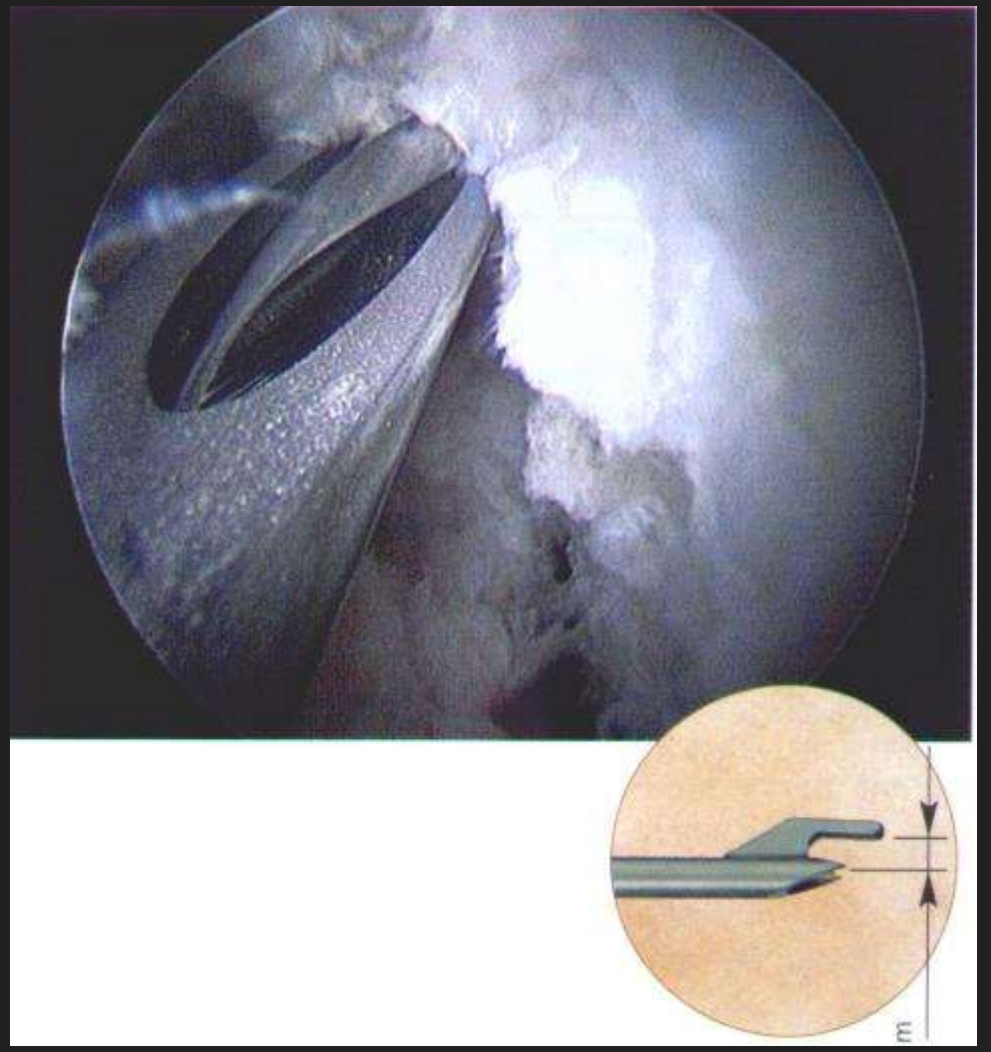
# 钻入导针



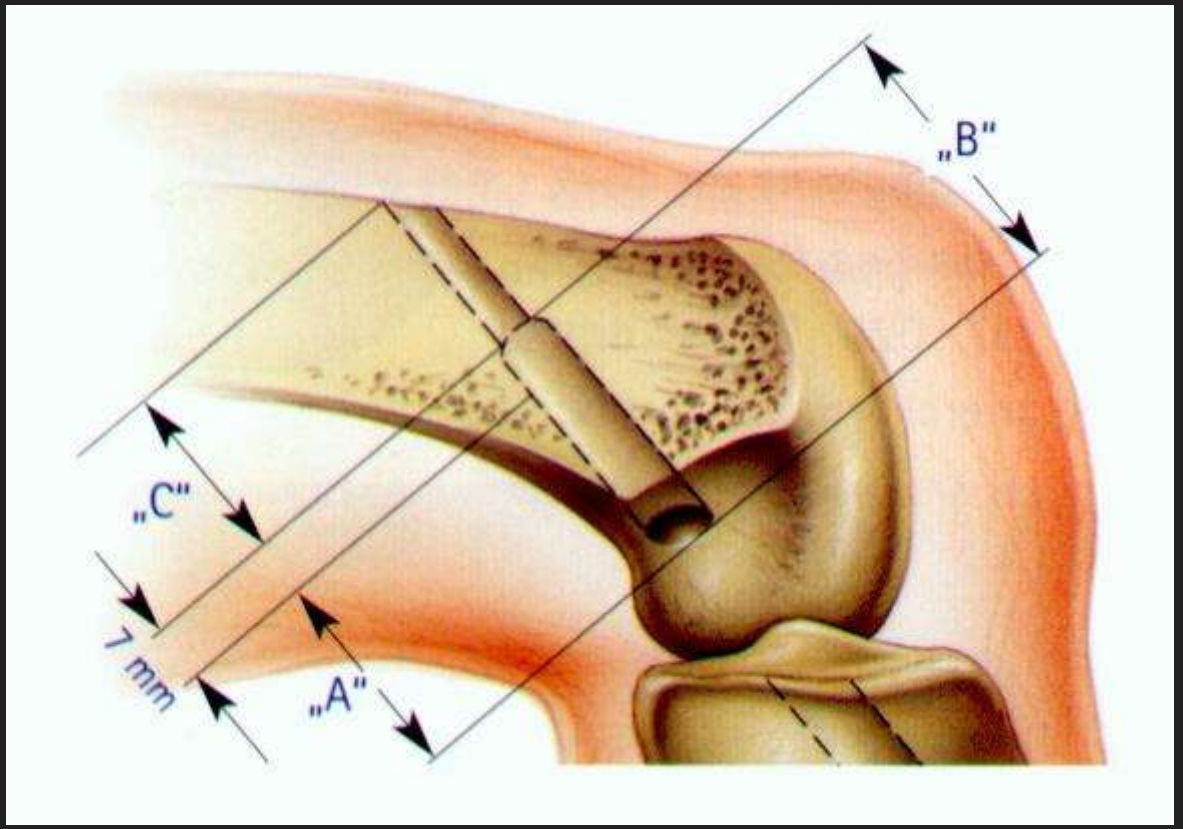
# 先以6mm钻头钻骨隧道，
# 再根据植入物直径钻最终隧道



经胫骨隧道插入5mm距差股骨隧道定位器，先钻入导针

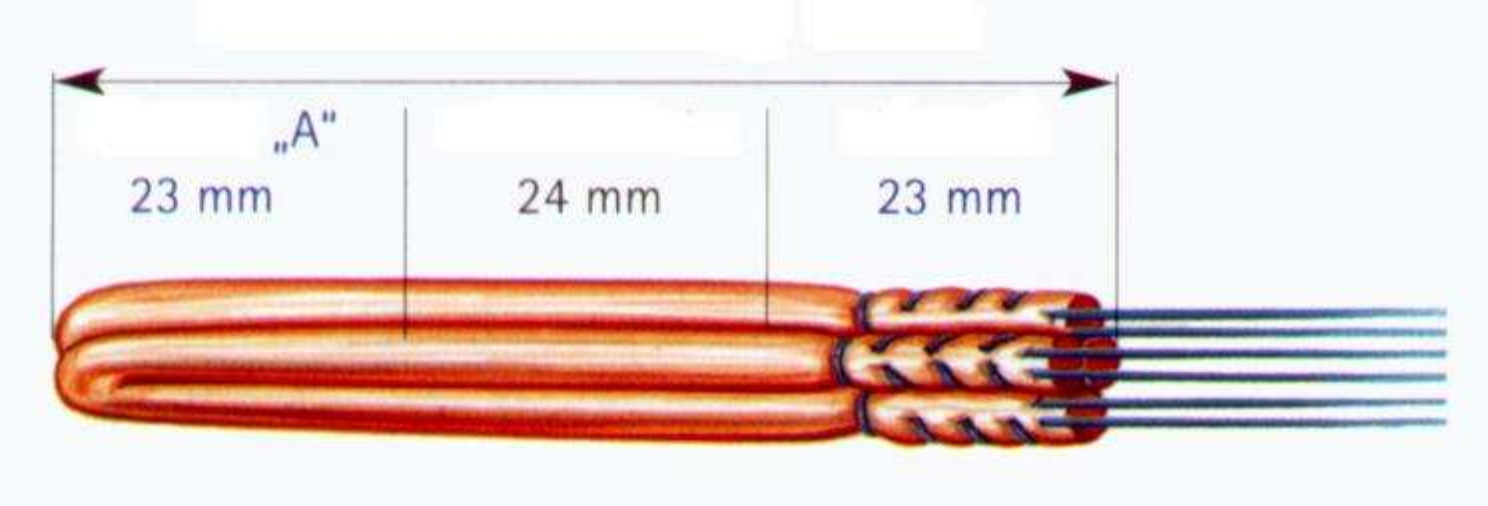


骨隧道的深度“B”
= 隧道内移植物长度（“A”）
+ 翻转所需深度（7mm）



# 关节腔内韧带长度
# 21-24mm

假设移植物总长
70mm

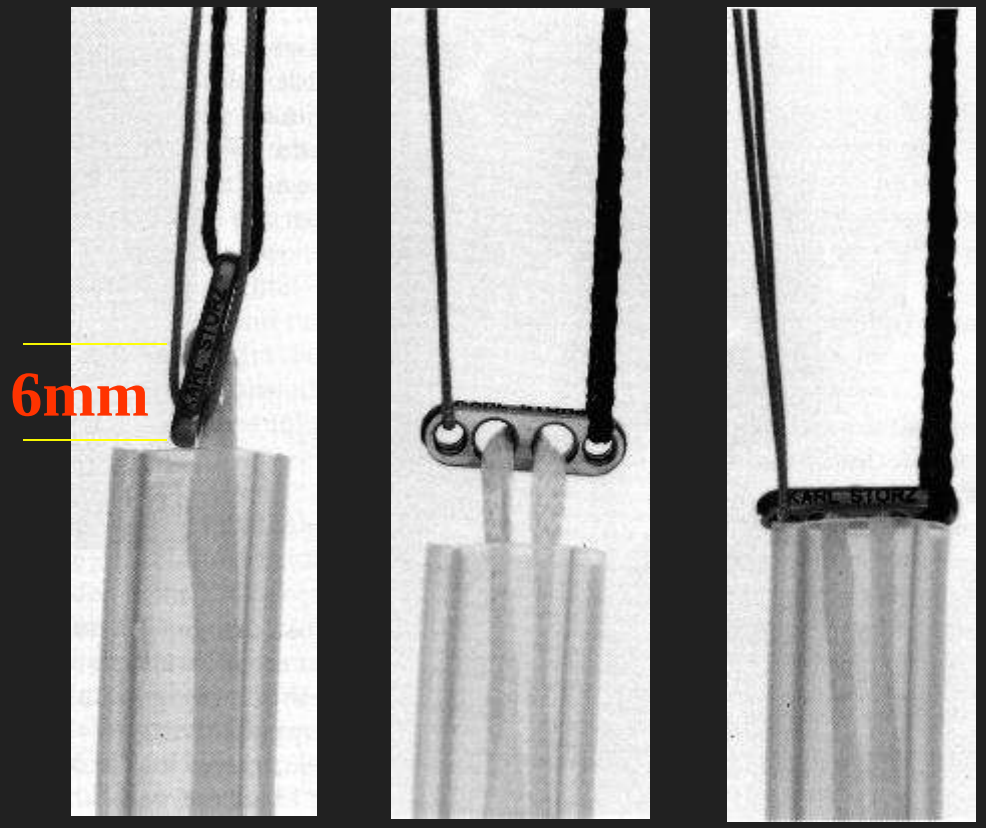



骨隧道深度 23mm+7mm = 30mm

# 翻转缝线钢板所需长度

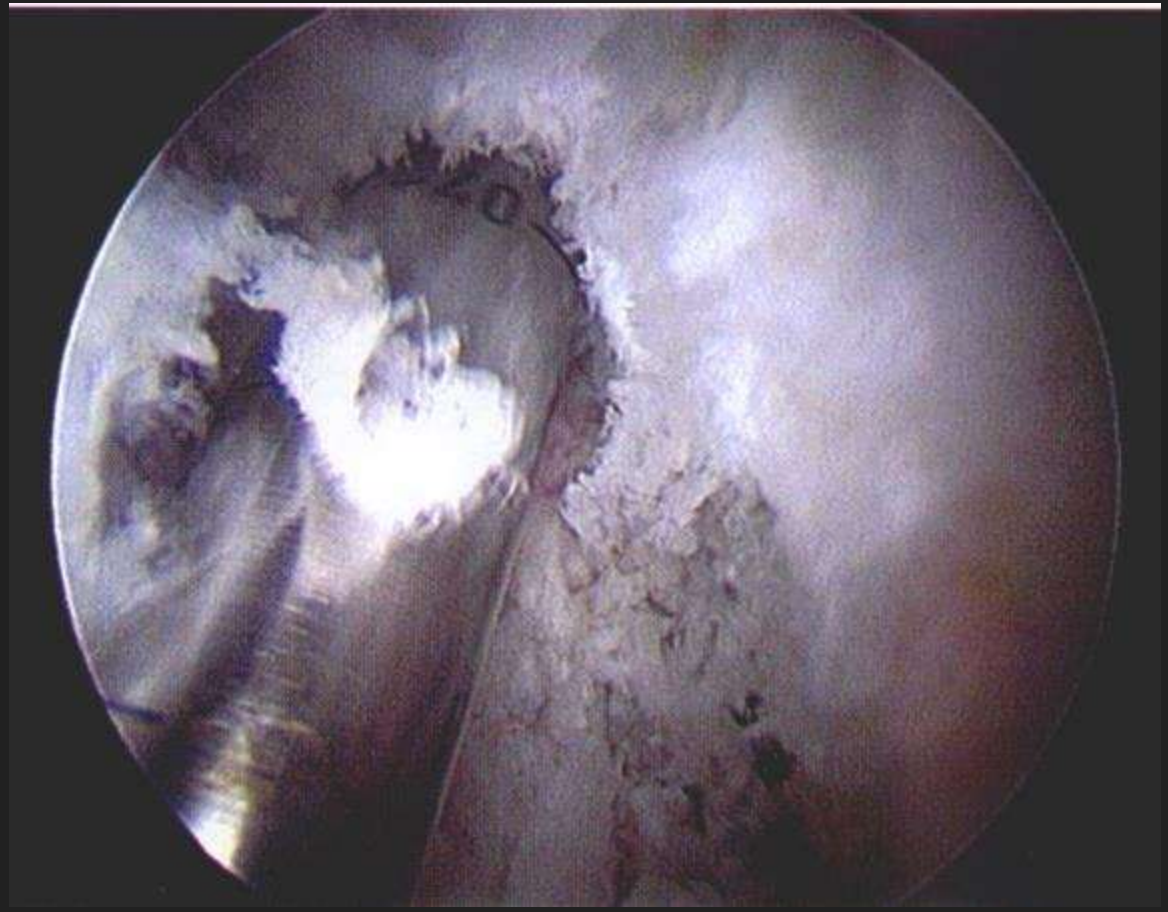
缝线钢板长
12mm

翻转需
6mm+1
mm
=7mm



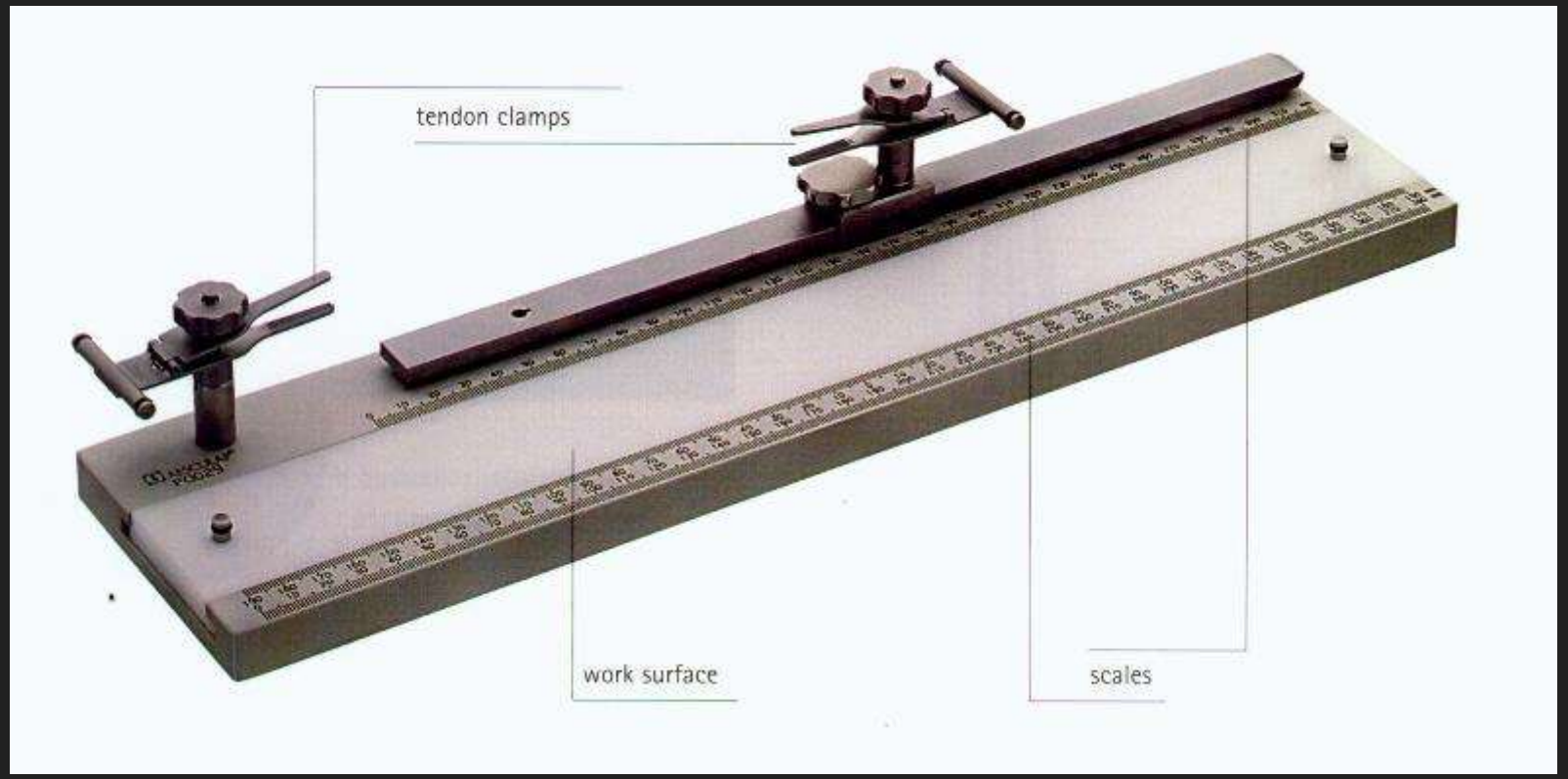
# 骨隧道的建立

## 根据计算所得深度钻股骨隧道



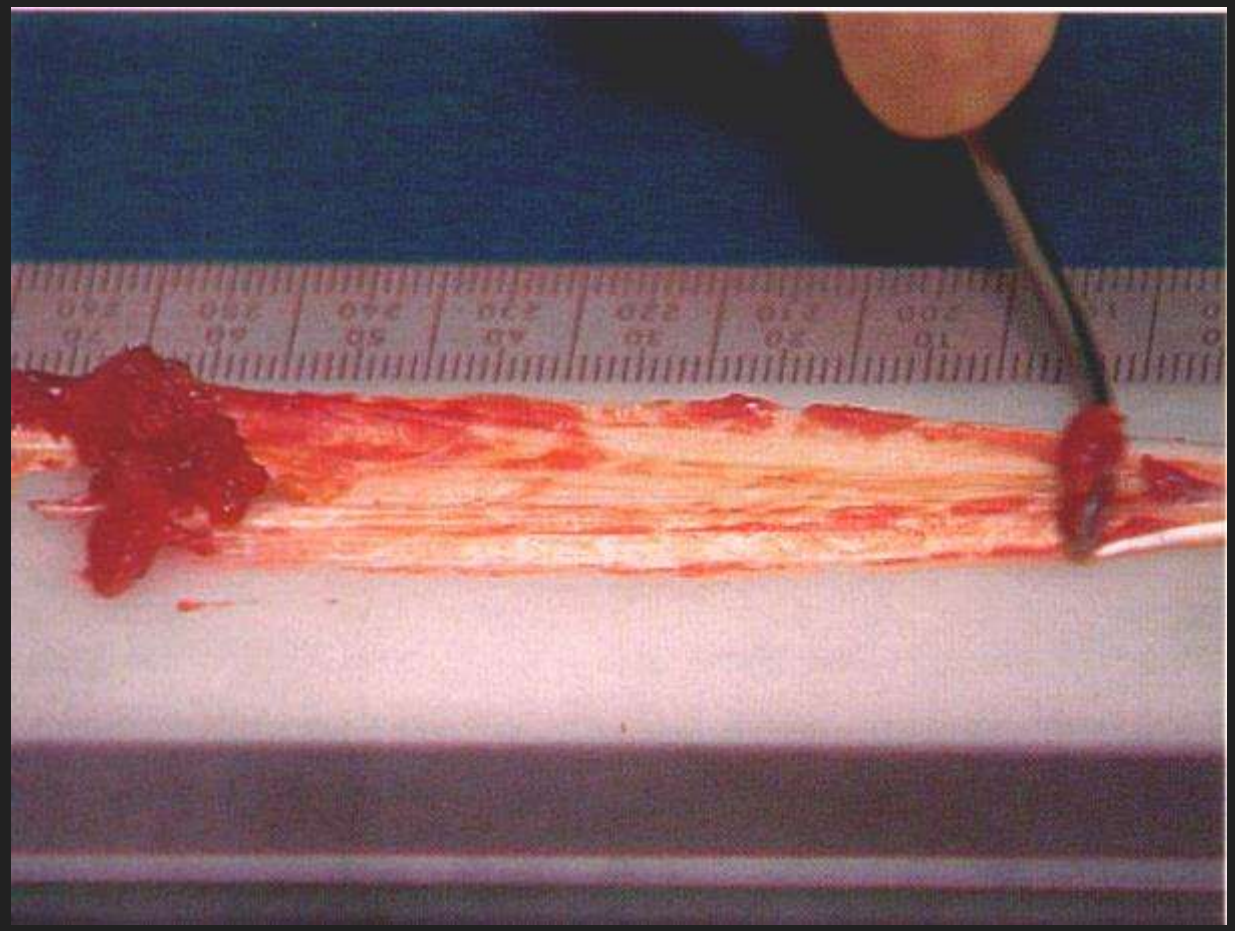
# 半腱肌肌腱的准备

## 肌腱操作板：测量、切割、缝织、预牵张



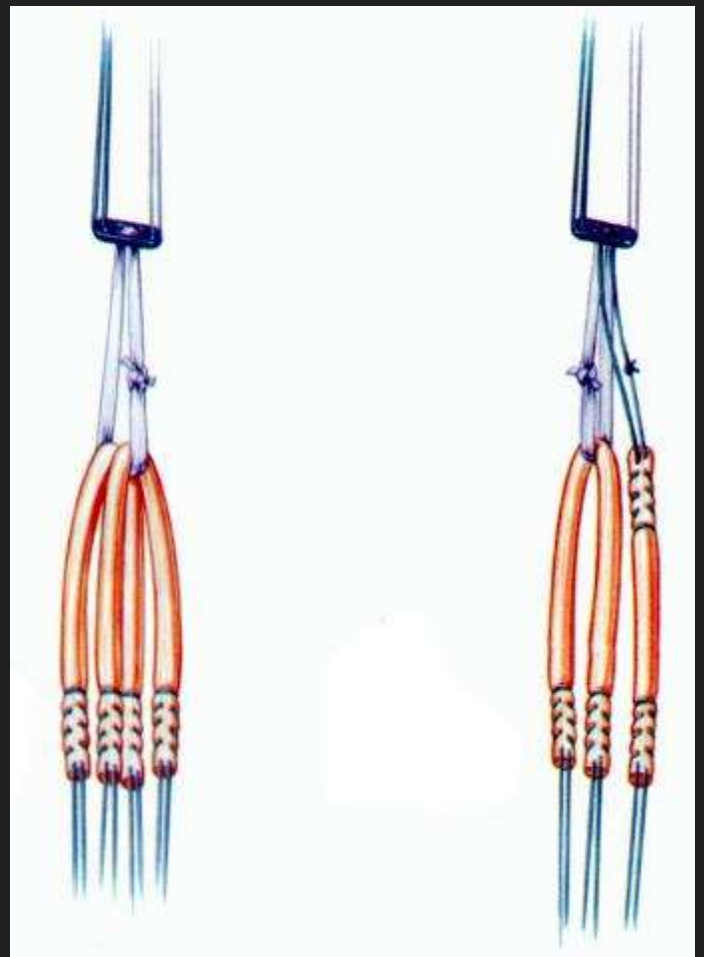
# 半腱肌腱的准备

## 刮除肌肉组织



肌腱总长
>24cm

四束法

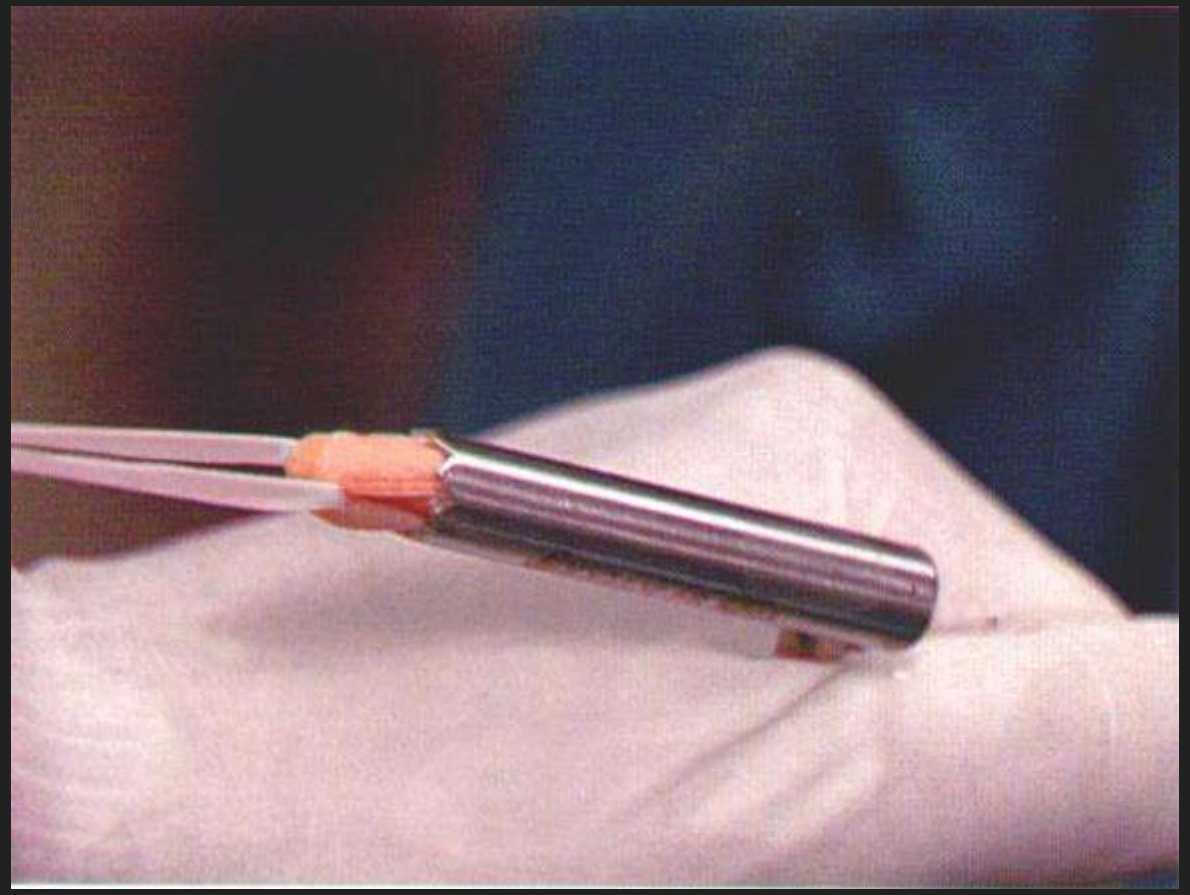


最终束长≥ 6cm!

肌腱总长
<24cm

三束法

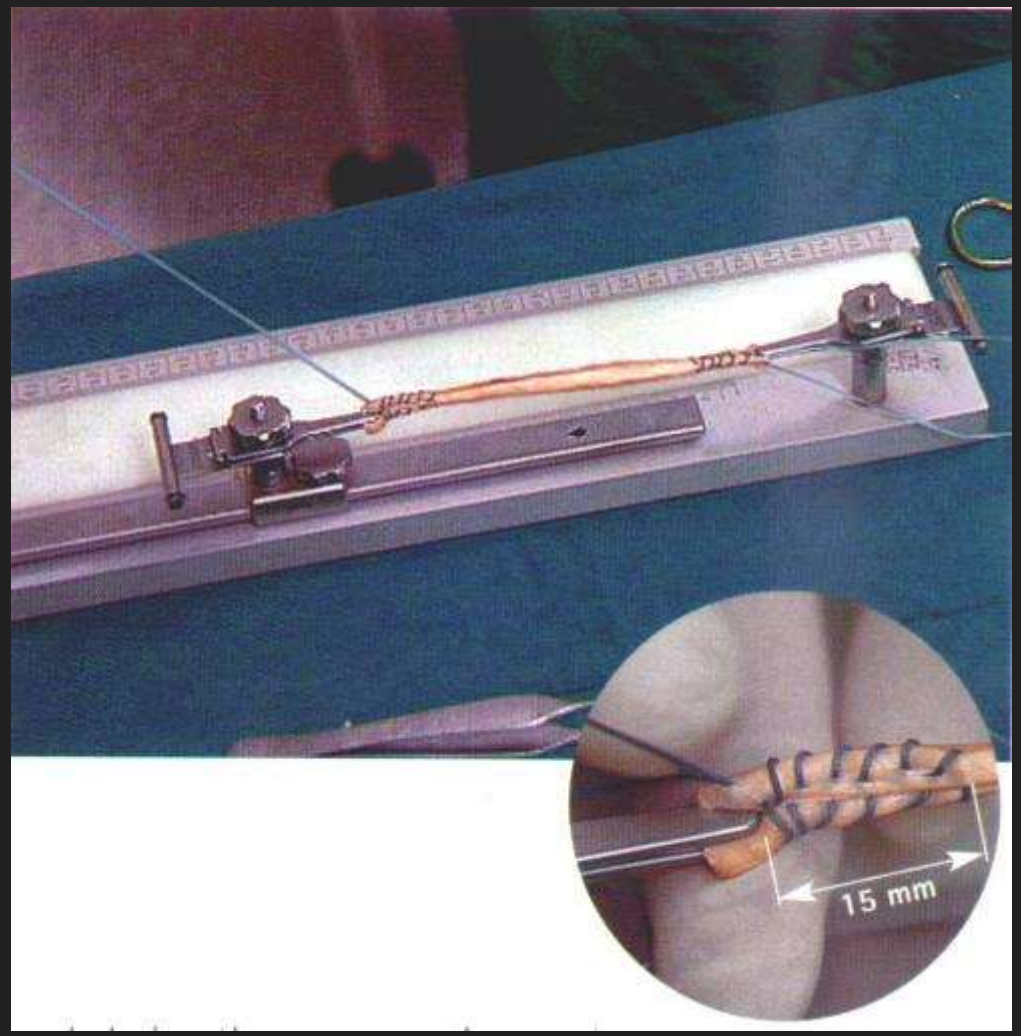
# 用钻头套管测移植物的直径



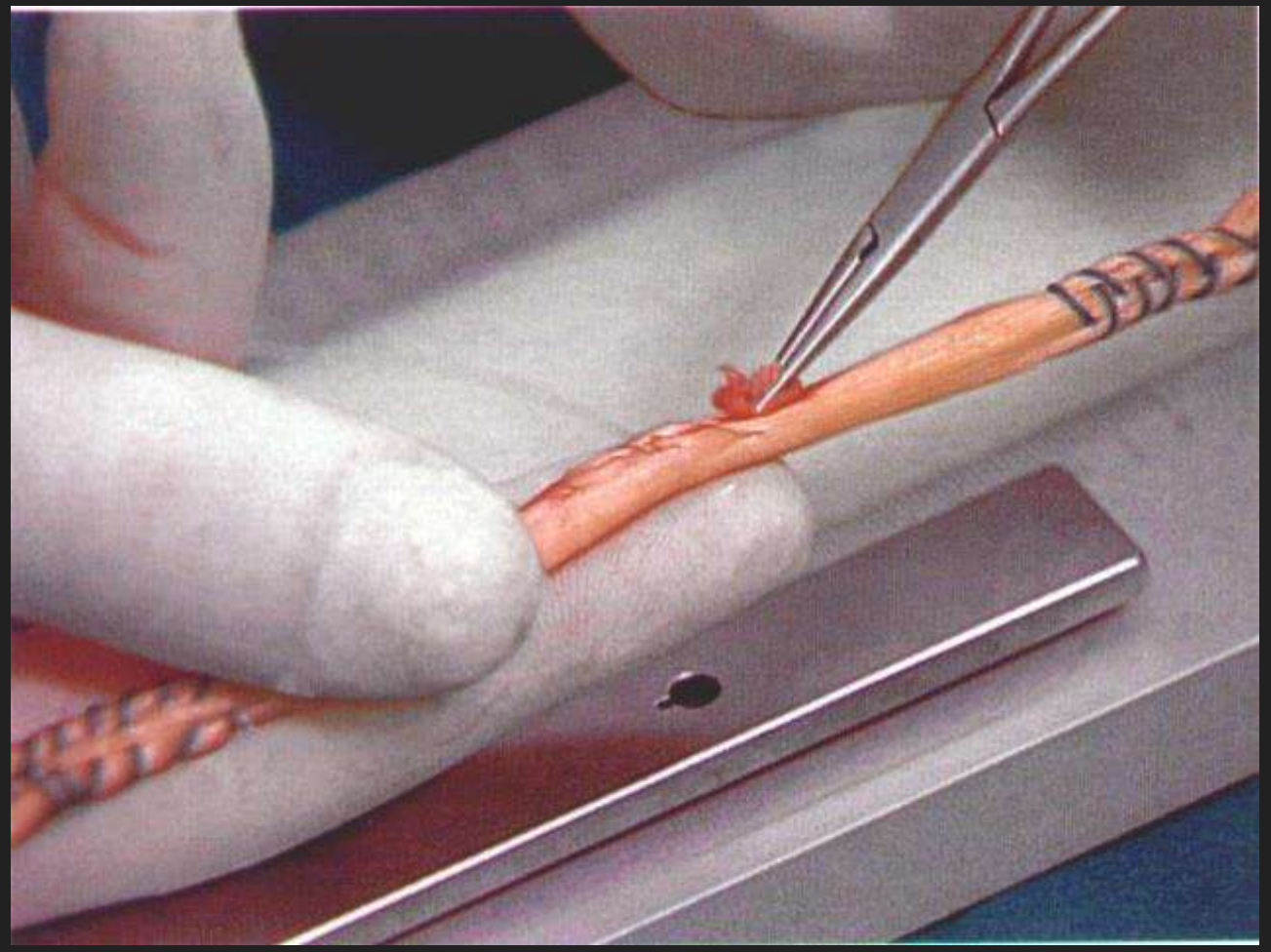
缝织半腱肌腱

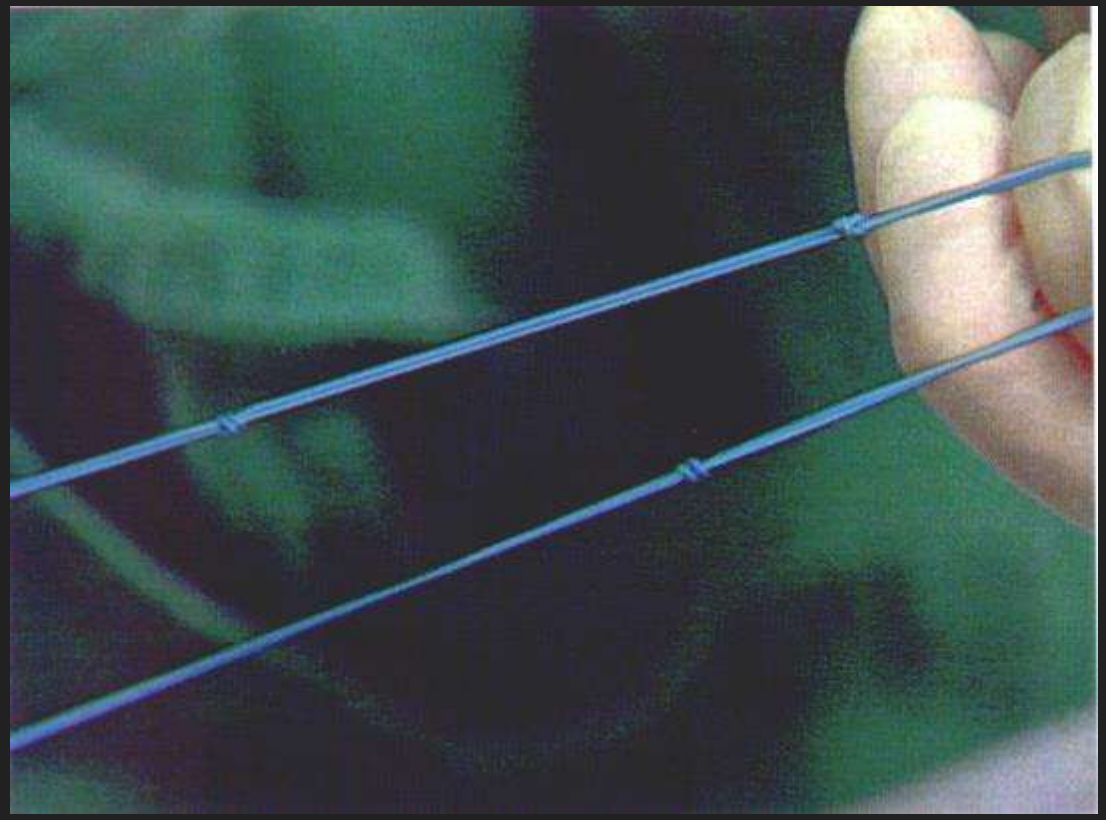
缝织段长15mm

针距2mm



# 将所取骨膜缝合于肌腱的股骨端

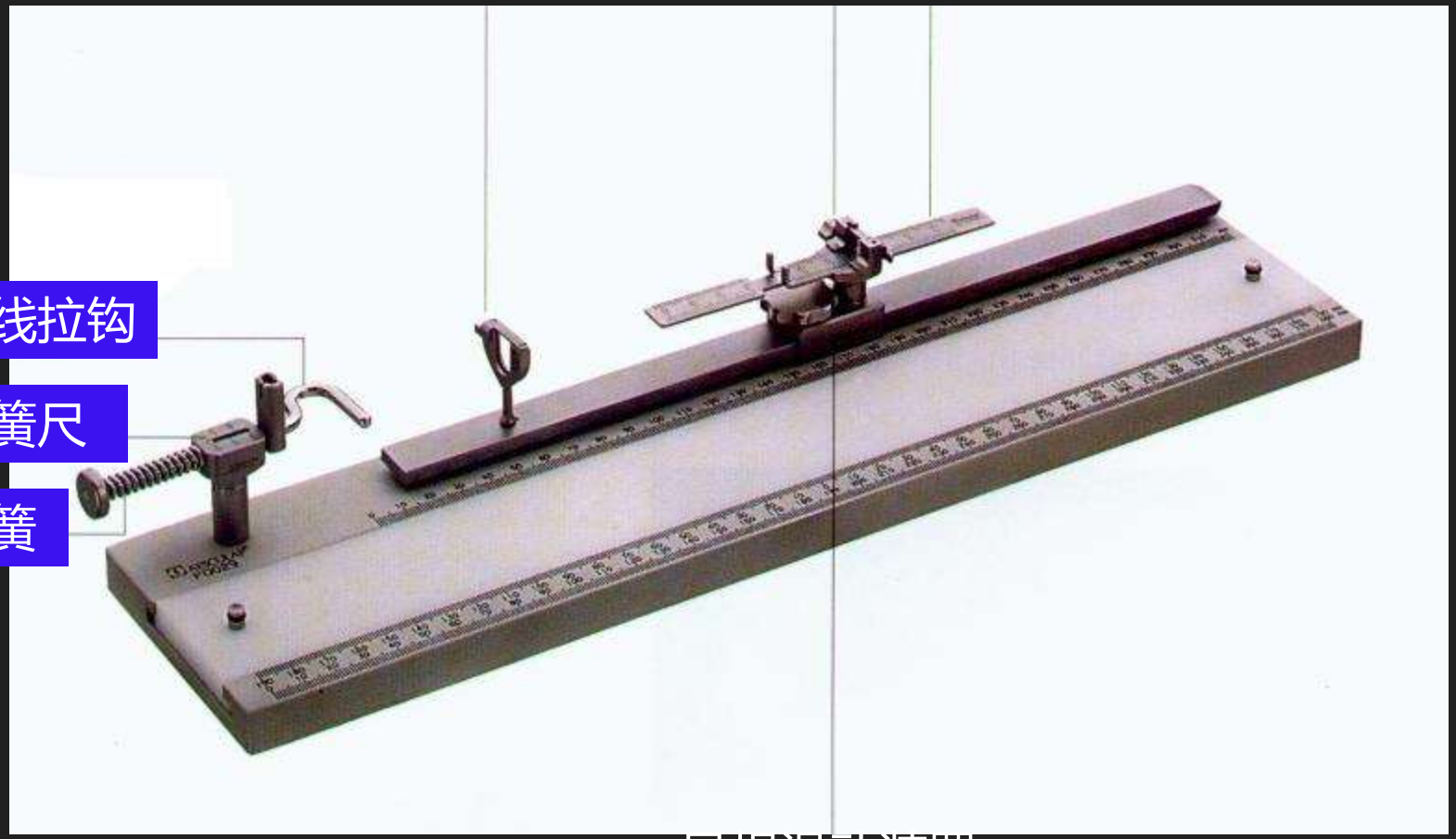




四束法时，粗的肌腱段两断打一个结，
细的肌腱段两断打两个结

# 肌腱预牵张

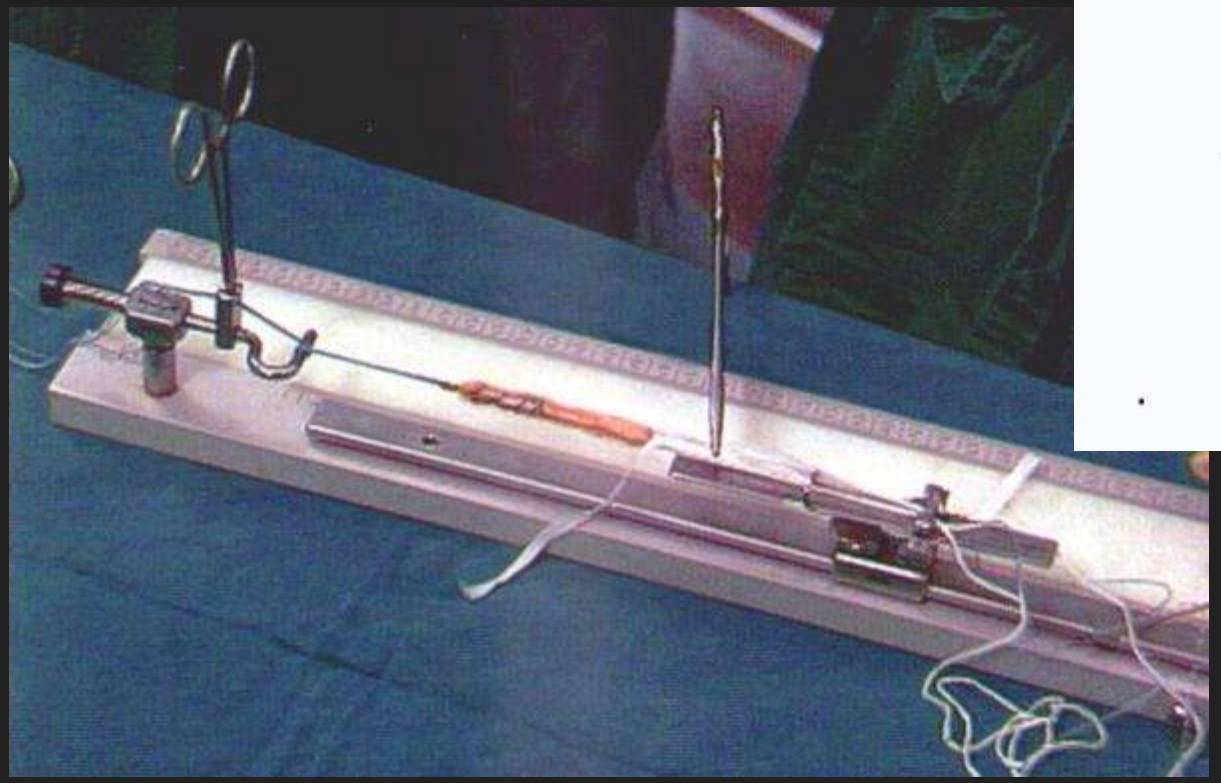
缝线纽扣夹持器　缝线钢板夹持器和聚乙烯带测控尺

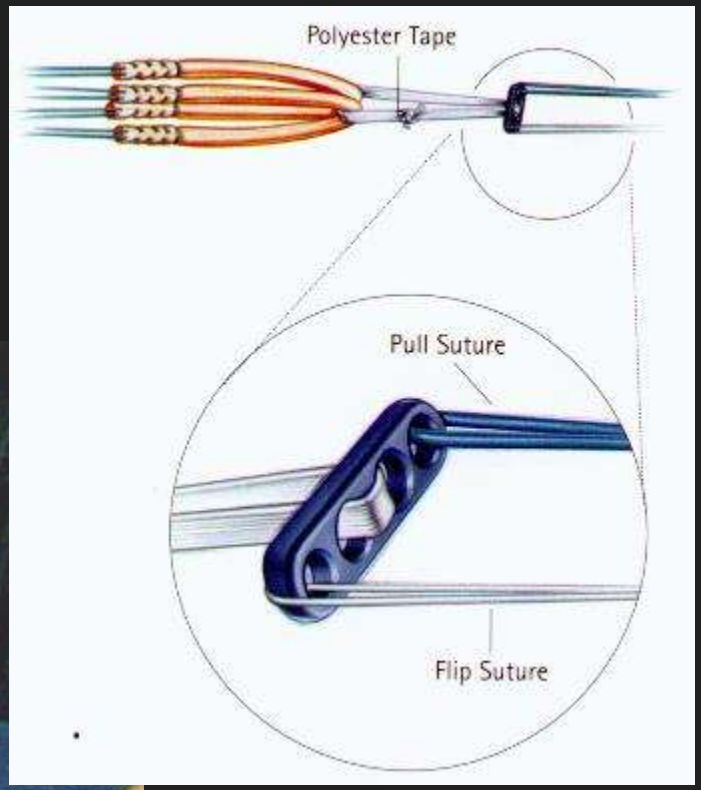



导规滑动装置

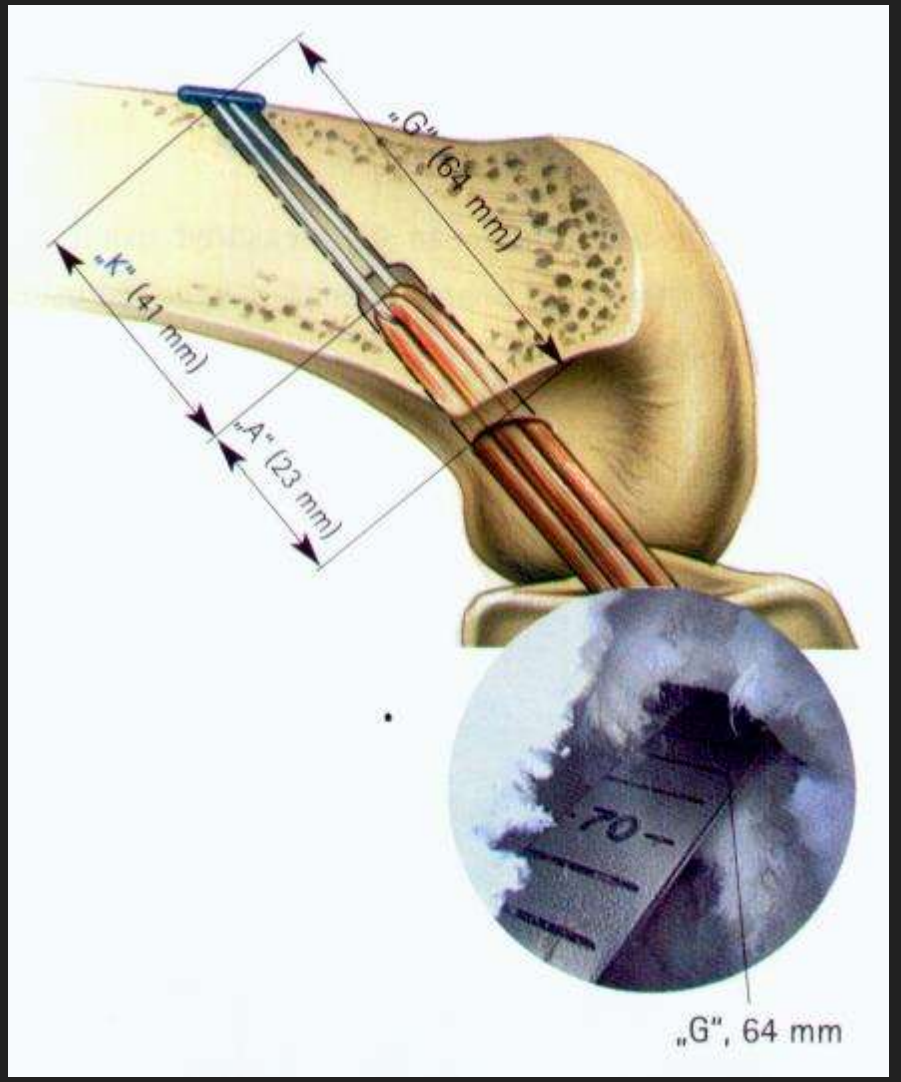
# 肌腱预牵张——移植物的固定

牵张力60-80牛顿，
时间至少5分钟

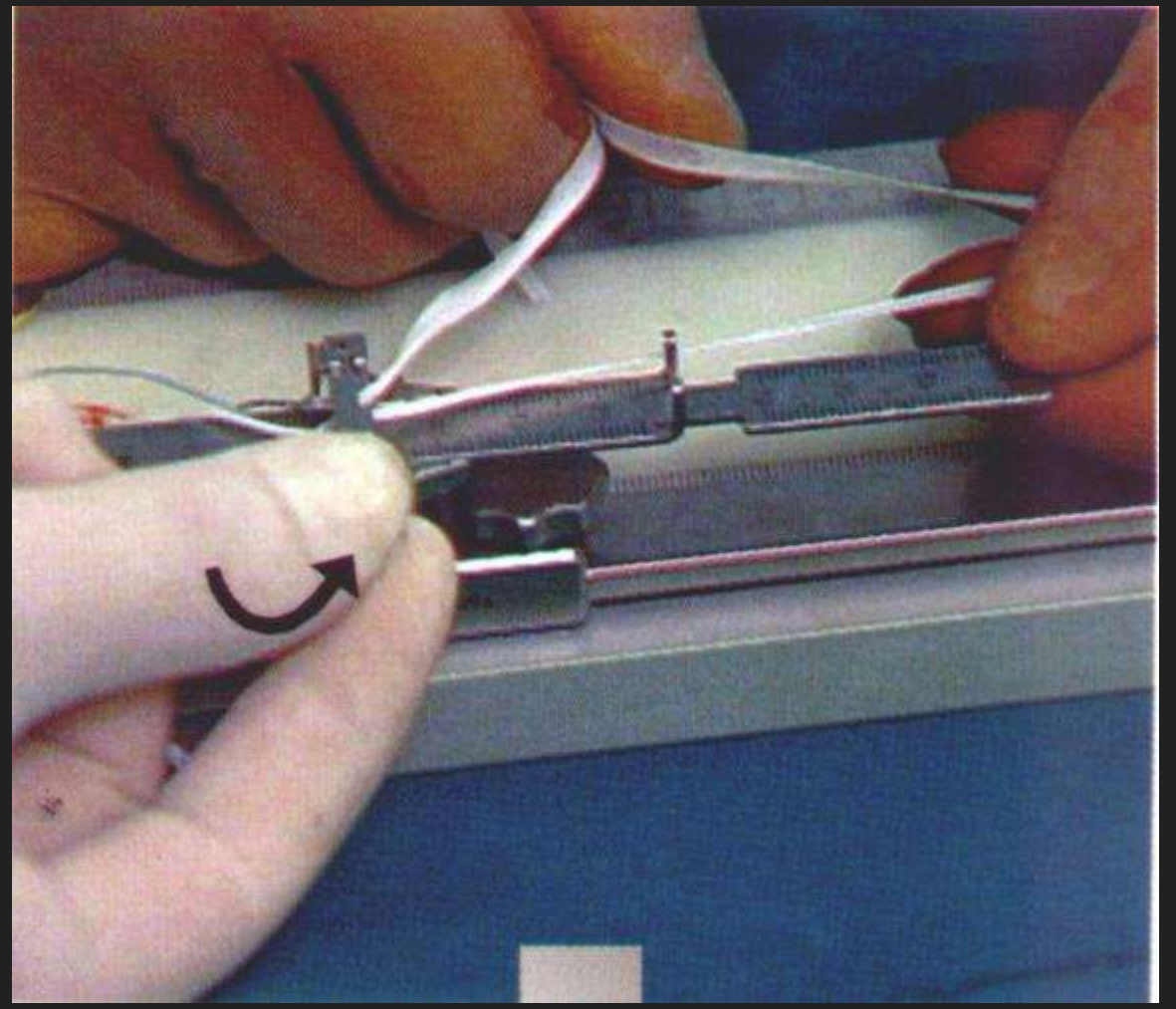




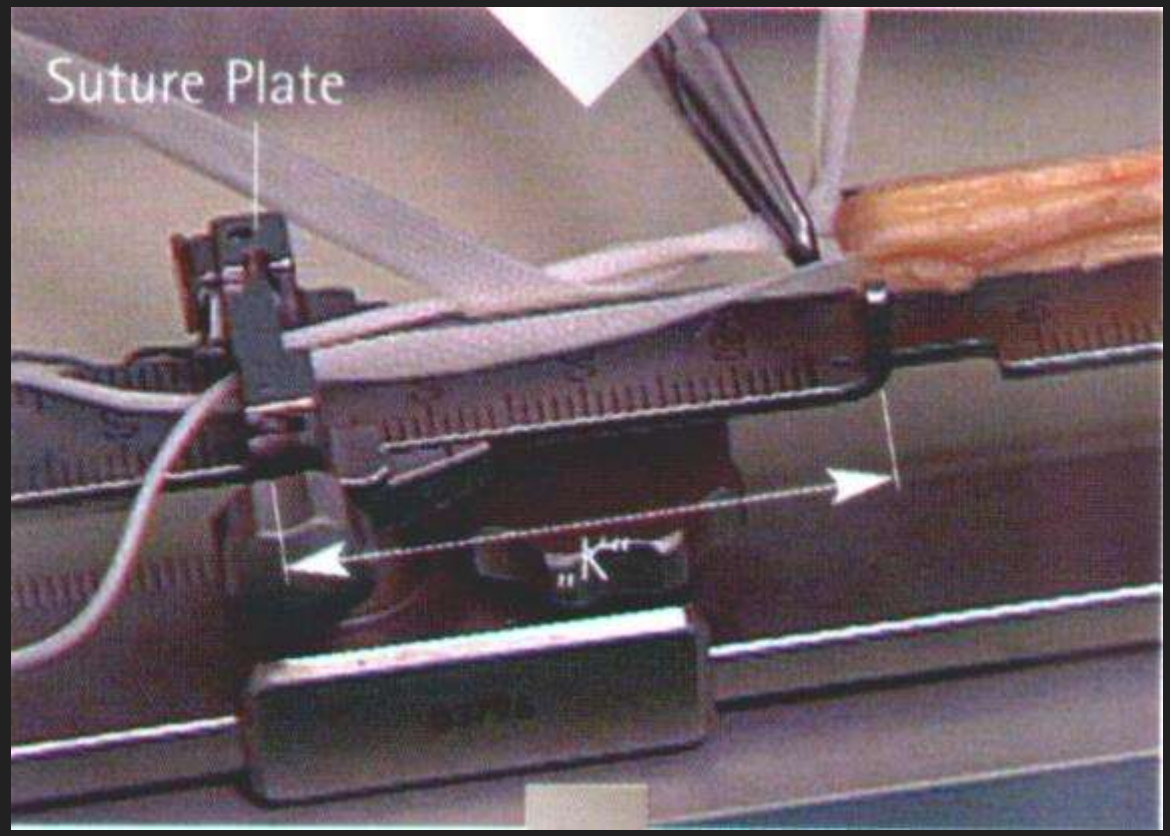
根据股骨隧道深度测定聚乙烯带长度



根据所需
长度调节
测控尺

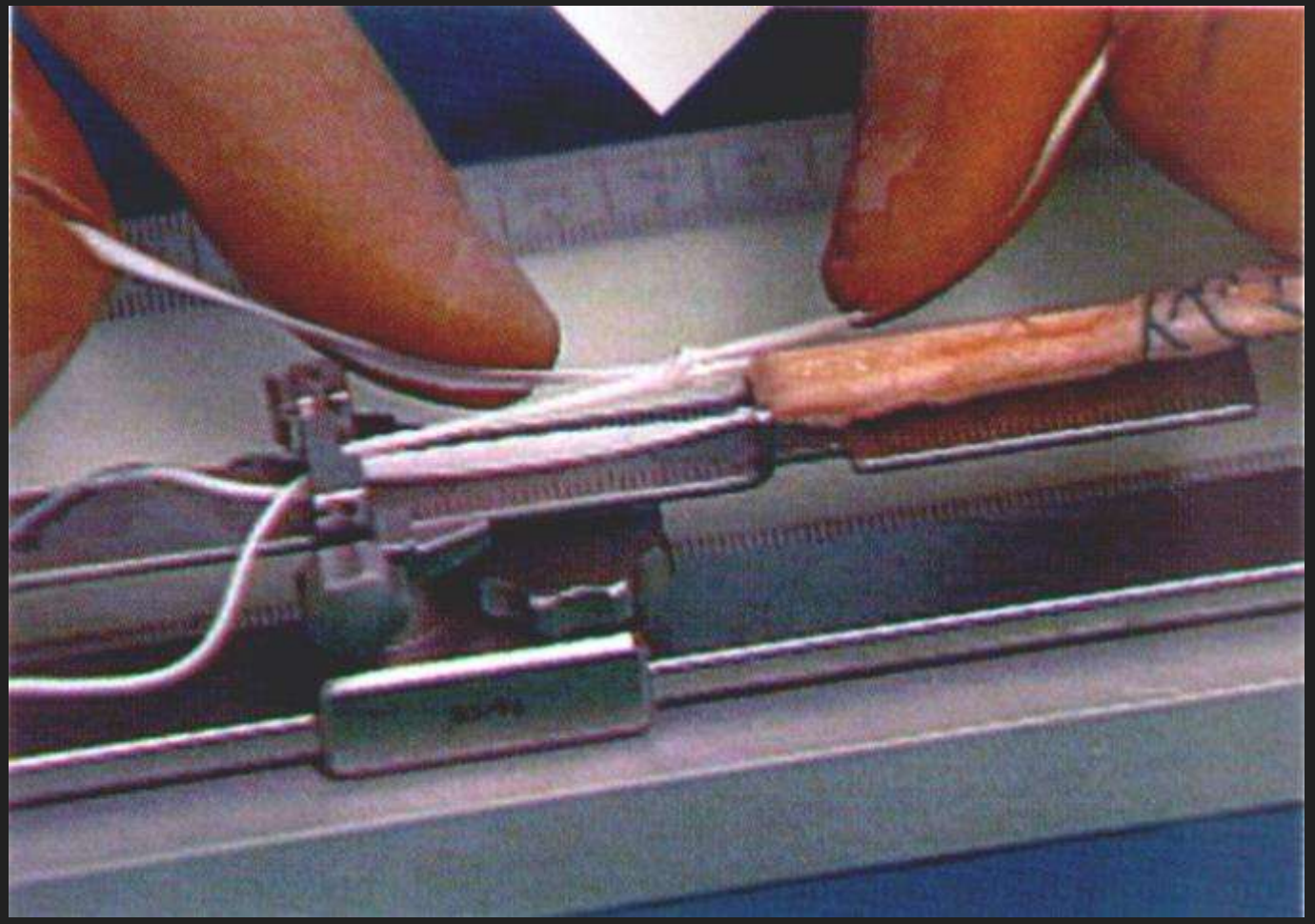


# 预张

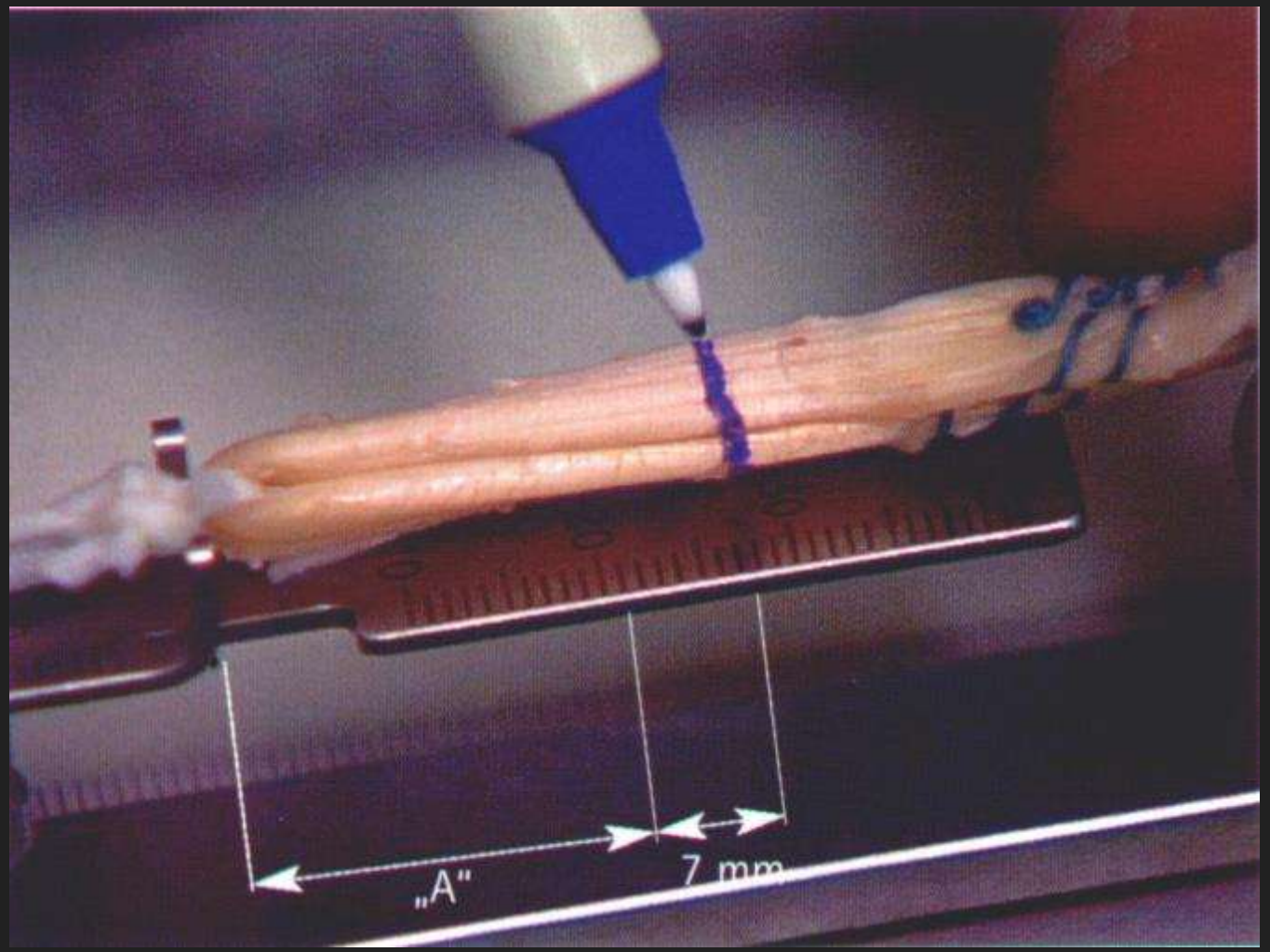



将移植物股骨端牵拉至0刻度位，　　聚乙烯带长度即为所需长度（本例为39mm）

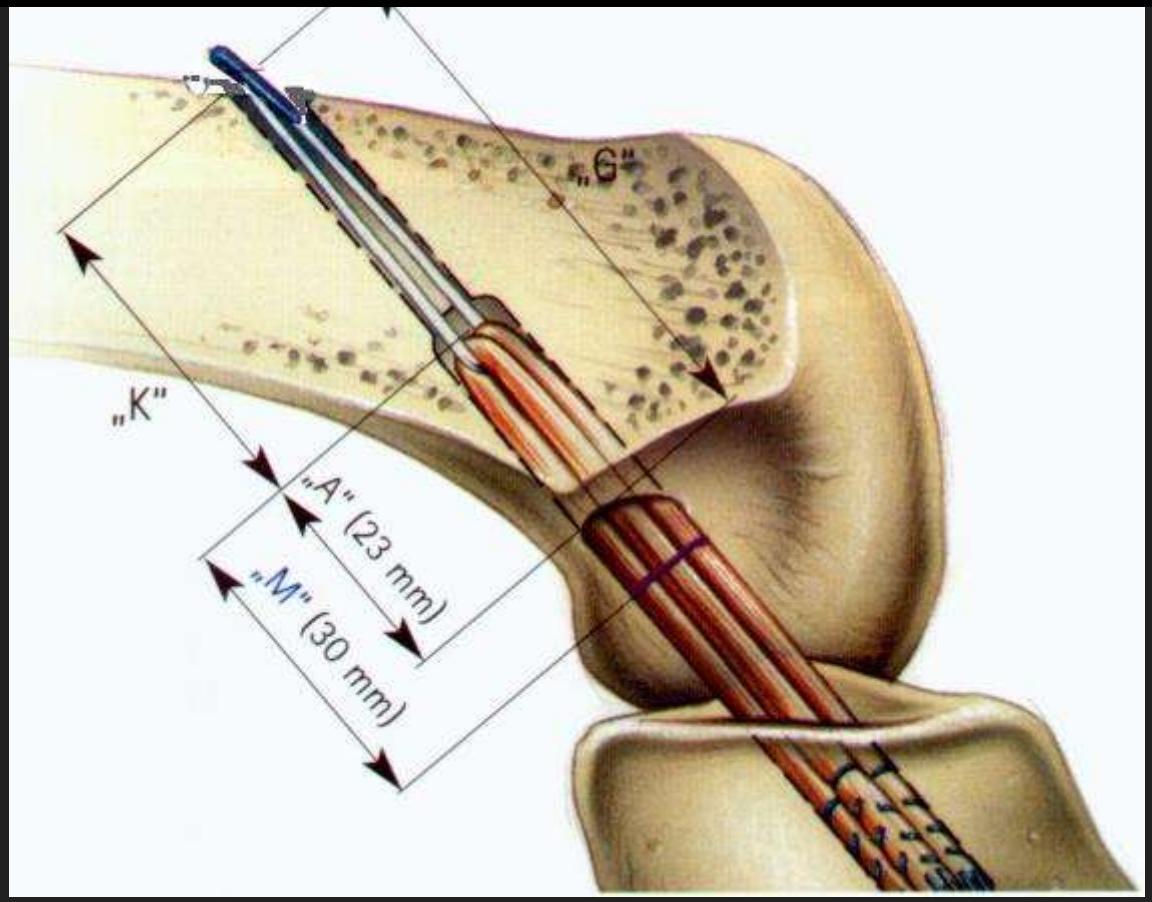
# 在韧带处于牵张状态下将聚乙烯带打结



# 股骨隧道内置韧带长度“A”+7mm处做标记

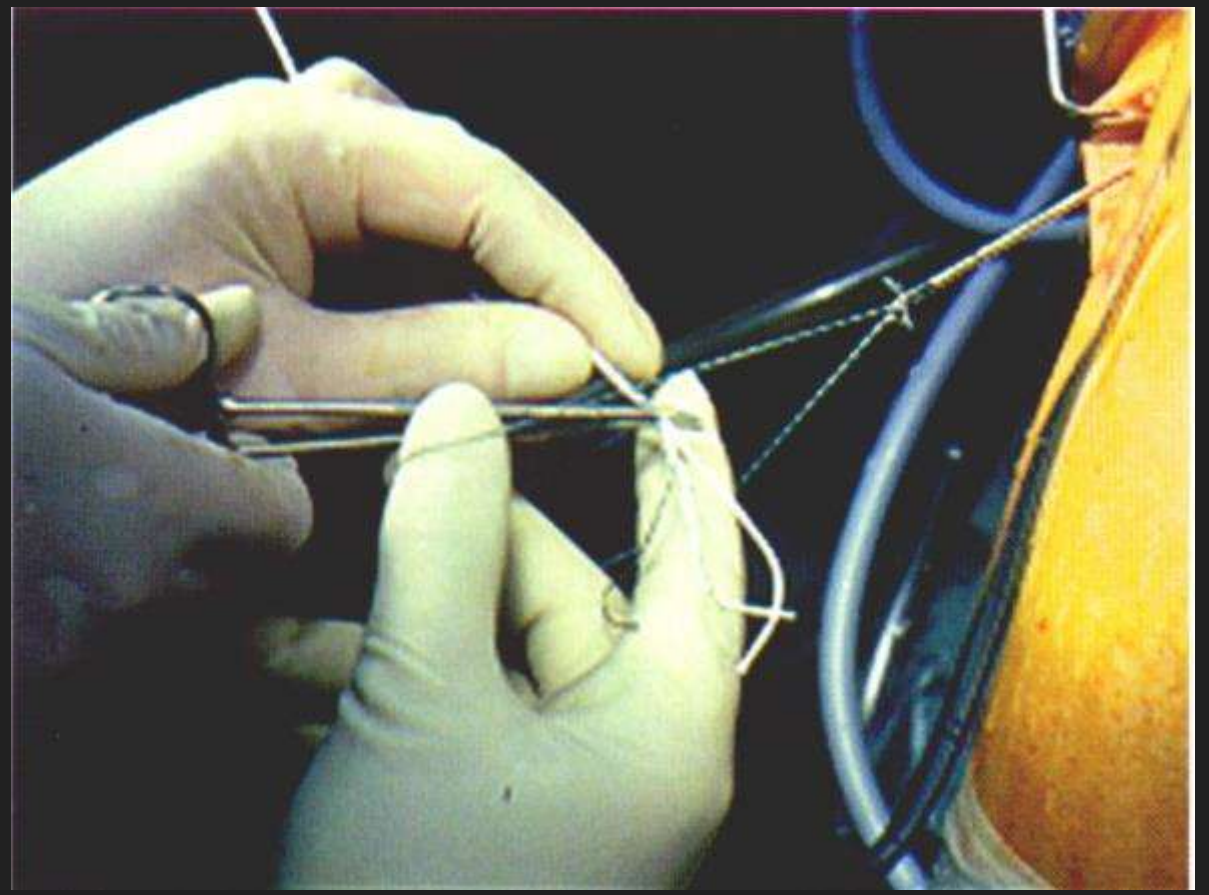


# 当该标记拉至股骨隧道口时，提示可以翻转缝线钢板

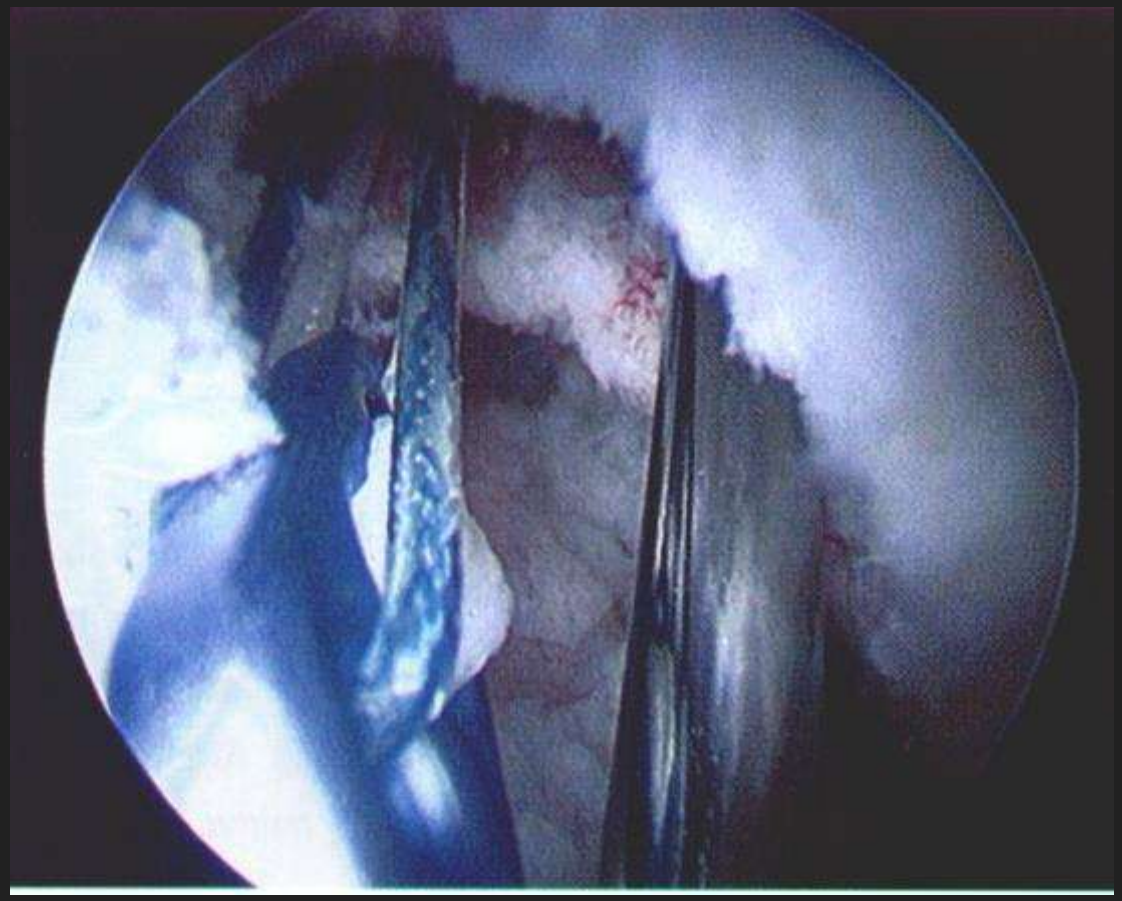


# 韧带的拉入和固定

## 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



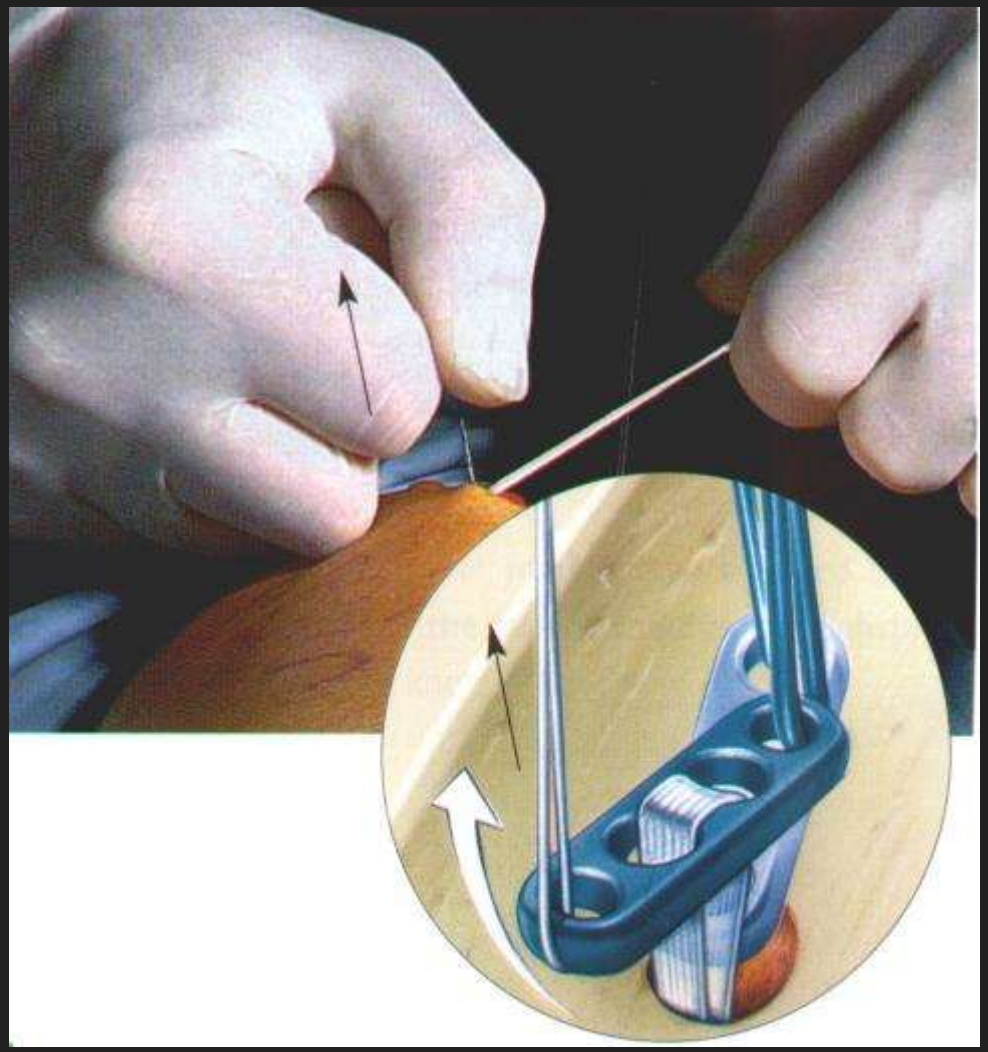
# 导针经骨隧道置入，穿大腿皮肤拉出。
# 通过牵引线将植入物拉入



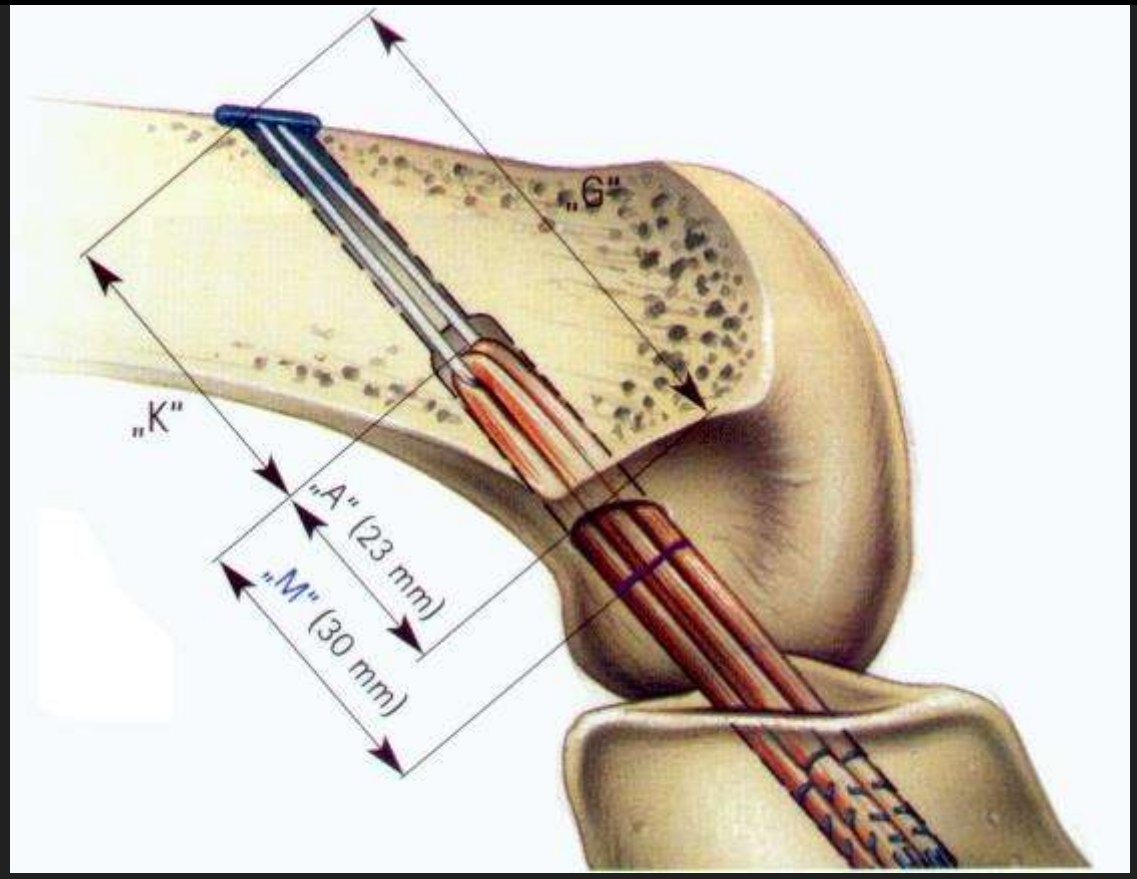
# 向股骨隧道内牵拉植入物至标记处

# 韧带的拉入和固定

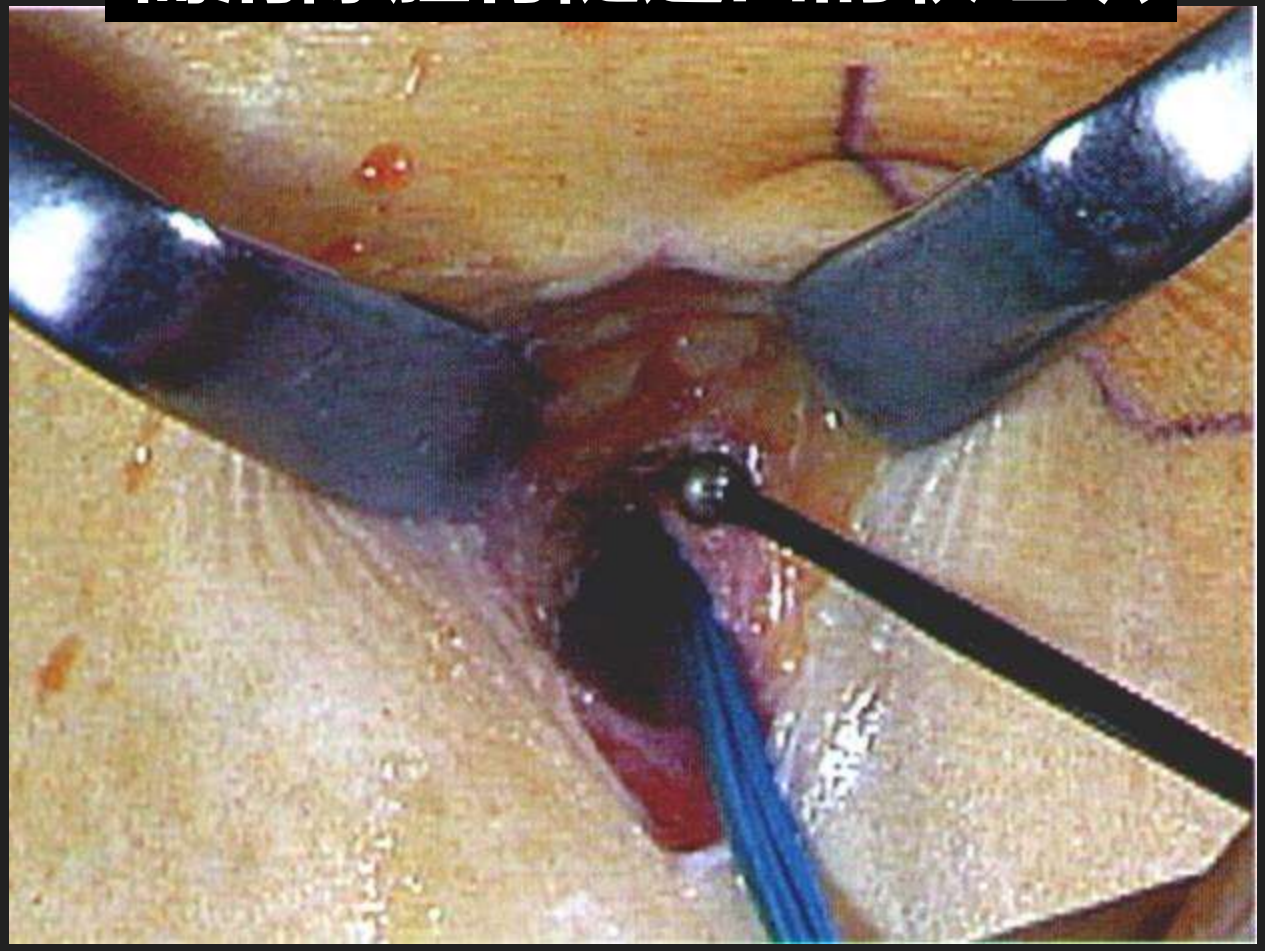
**牵拉翻转线，**
**翻转缝线钢板**



# 回拉植入物，股骨端即得到固定，标记线回入关节腔7mm

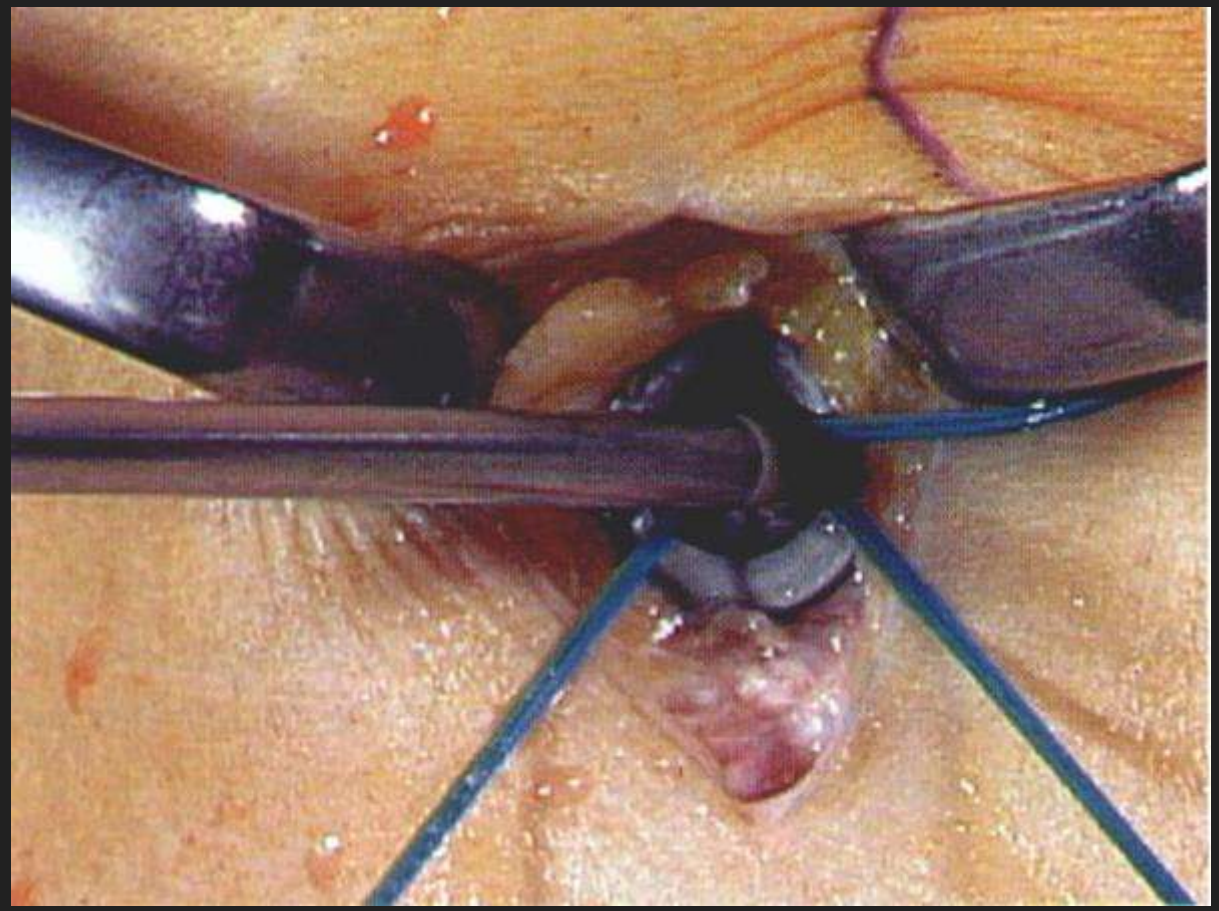


# 在胫骨端固定之前
# 需清除胫骨隧道口的软组织

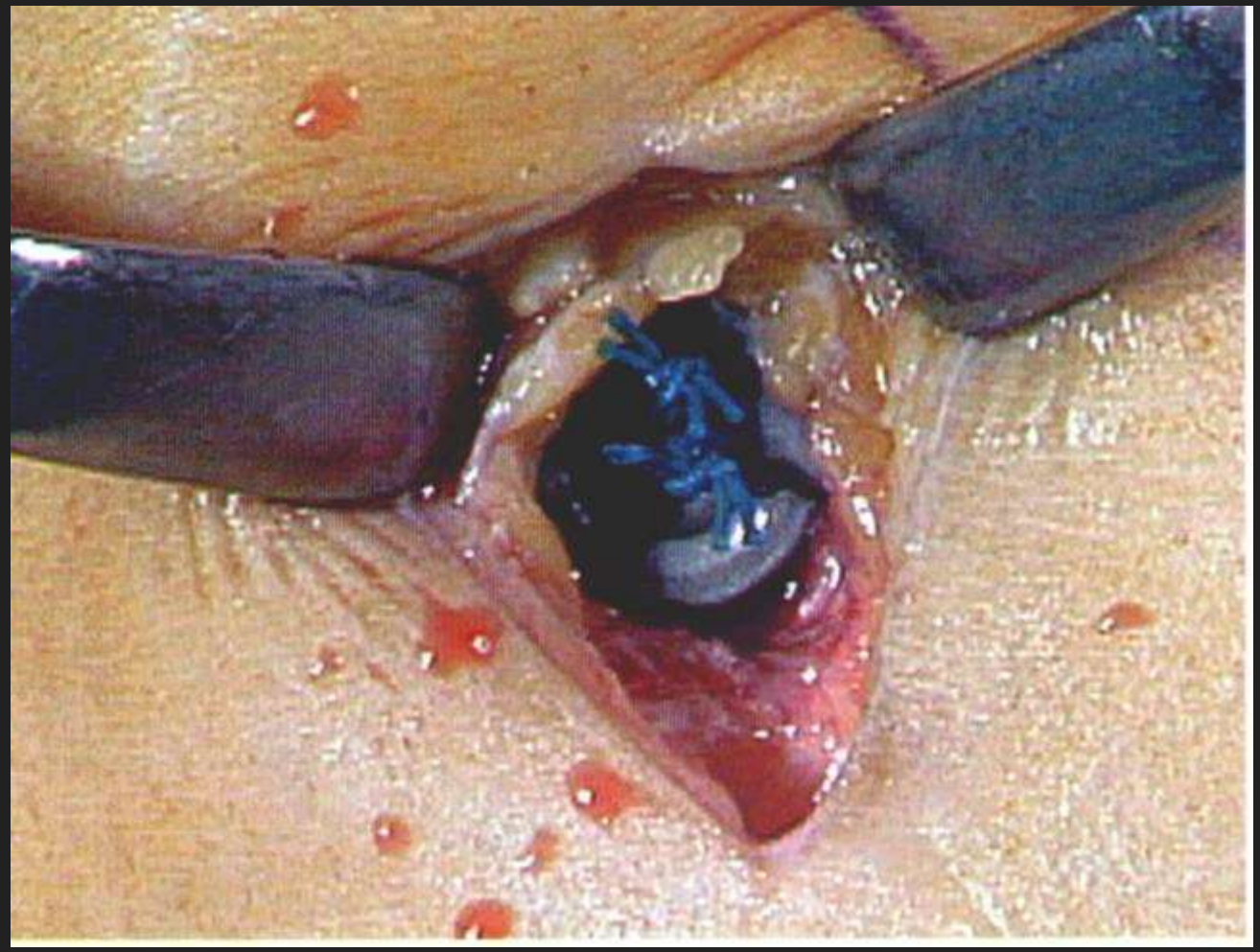


# 固定

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



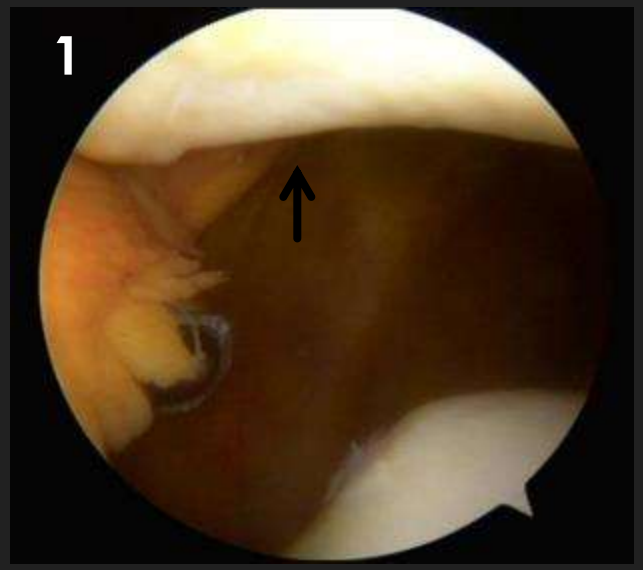
# 固定完毕

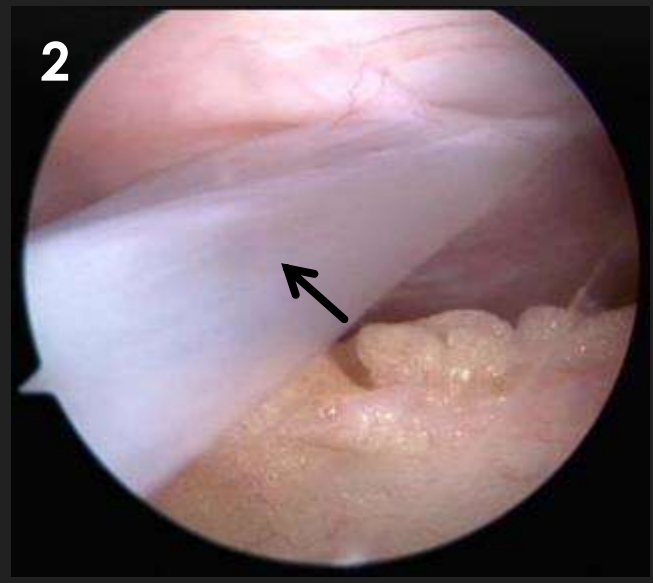


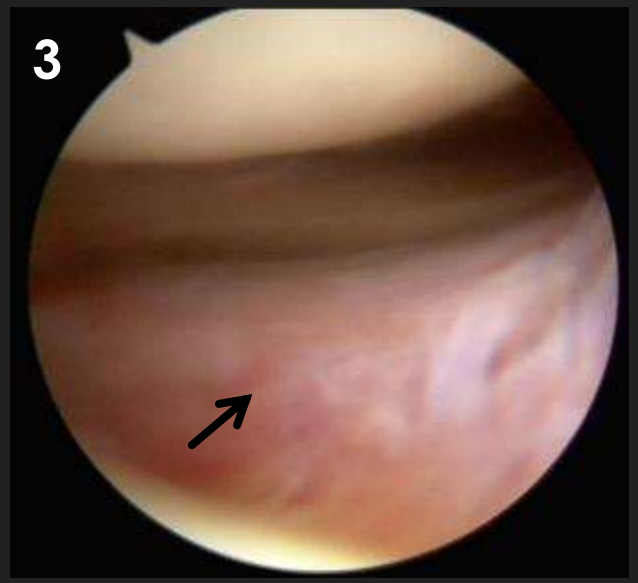
# 半腱肌重建前交叉韧带的优点

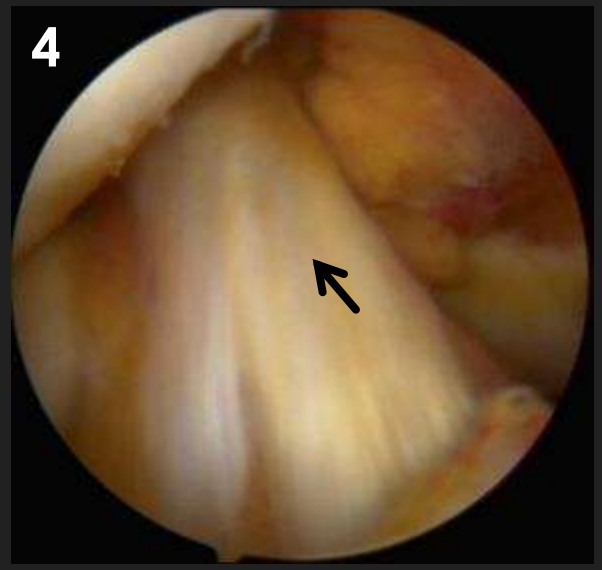
- 切口小、美观
- 对伸膝装置无干扰
- 四束肌腱的血液供应好
- 移植物弹性模量同前交叉韧带类似
- 可同时重建前内侧束和后外侧束

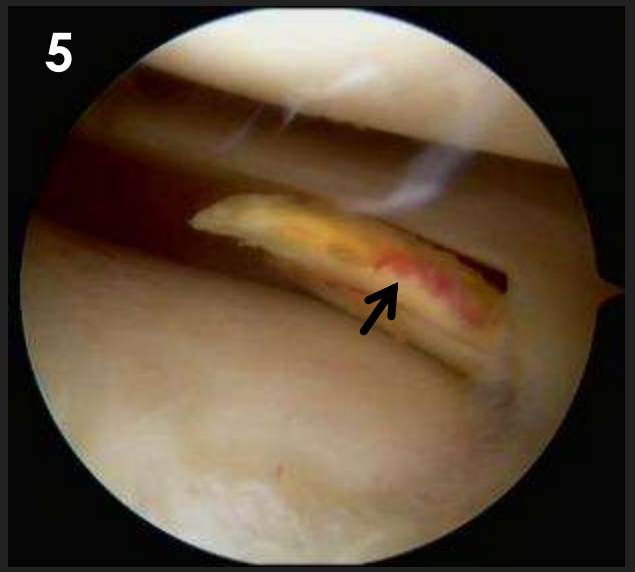
# 关节镜下探查




Thank You!