

成人股骨颈骨折诊治指南

中华医学会骨科学分会创伤骨科学组 中国医师协会骨科医师分会创伤专家工作委员会

通信作者: 张长青, 上海交通大学附属第六人民医院骨科, Email: zhangcq@sjtu.edu.cn; 张英泽, 河北医科大学第三医院, Email: yzling_liu@163.com; 余斌, 南方医科大学南方医院创伤骨科, Email: yubinol@163.com

执笔者: 张伟, 上海交通大学附属第六人民医院骨科, Email: orthozhang@163.com; 孙辉, 上海交通大学附属第六人民医院骨科, Email: sunshine20002000@126.com

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Corresponding authors: Zhang Changqing, Department of Orthopaedics, The Sixth People's Hospital Affiliated to Shanghai Jiao Tong University, Email: zhangcq@sjtu.edu.cn; Zhang Yingze, The Third Hospital of Hebei Medical University, Email: yzling_liu@163.com; Yu Bin, Department of Orthopaedics and Traumatology, Nanfang Hospital, Southern Medical University, Email: yubinol@163.com

Designated writer: Zhang Wei, Department of Orthopaedics, The Sixth People's Hospital Affiliated to Shanghai Jiao Tong University, Email: orthozhang@163.com; Sun Hui, Department of Orthopaedics, The Sixth People's Hospital Affiliated to Shanghai Jiao Tong University, Email: sunshine20002000@126.com

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股骨颈骨折是临床较常见的骨折,然而在临床诊治中还存在诸多问题,如当前常用的骨折分型系统虽然能够从不同角度区分骨折特征,可以一定程度上指导治疗,但仍然存在明显的局限。股骨颈骨折的治疗方案多种多样,但如何形成规范和推广应用,仍需努力。因此,为了有效地指导国内成人股骨颈骨折的诊断和治疗,中华医学会骨科学分会创伤骨科学组和中国医师协会骨科医师分会创伤专家工作委员会组织专家共同商议制定了本指南。本指南仅适用于 18 岁以上骨骼闭合的成人及一般外伤引起的新鲜非病理性股骨颈骨折。

概 论

目前,中国人的股骨颈骨折的发生已占全身骨折的 3.6%,占髋部骨折的 48%~54%^[1]。最常见人群是老年患者,多由跌倒等低能量损伤引起^[2]。年轻人股骨颈骨折多由高能量暴力损伤造成,仅占此部位骨

折患者的 3%^[3]。随着影像技术及设备、内固定材料及设计、治疗理念及手术技术的进步,股骨颈骨折的治疗效果已得到显著改善^[4]。然而,股骨颈骨折的并发症,特别是骨折不愈合和股骨头缺血性坏死的发生率仍较高。据近期文献报道,年轻股骨颈骨折患者股骨头坏死的发生率达 14.3%,骨折不愈合率达 9.3%^[5-6]。还有其他并发症如股骨颈短缩等。如何有效诊断和治疗成人股骨颈骨折和改善患者预后是当前临床医师所面临的挑战之一。

诊 断

一、诊断依据

(一)损伤机制与临床表现

老年人群中股骨颈骨折通常由低能量损伤所致,如站立高度跌倒。老年患者骨质量较差(骨量减少、骨质疏松症)、内科合并症多(糖尿病等)、有摔倒倾向(神经性疾病、退化性肌张力降低、肌肉减少症、维生

素 D 缺乏等)、营养不良等均是发生股骨颈骨折的危险因素。骨量减少及骨质疏松症诊断标准参照《原发性骨质疏松症诊疗指南(2017)》^[7]。

对年轻人群来说,股骨颈骨折通常由高能量暴力引起,如高处坠落伤或高速交通事故伤^[8]。损伤机制一般是下肢在外展位时遭受严重轴向暴力撞击。全面、完整的体格检查是年轻患者股骨颈骨折临床评估的基础,可早期发现患者是否存在并存损伤。

股骨颈骨折患者常会主诉外伤后腹股沟部疼痛和髋关节活动障碍,部分患者会同时主诉膝关节疼痛。老年患者即使无明确外伤史也必须进行髋关节查体及完整体检,特别是骨质疏松性骨折好发部位及肢体以远部位,如脊柱、腕部、足跟等,注意防止漏诊。股骨颈不完全性或外展嵌插型骨折可能只有髋部轻微疼痛、能够负重或行走,必须结合体检及影像学检查,以避免漏诊。移位型股骨颈骨折会出现髋部严重疼痛、无法负重、主动及被动活动髋关节疼痛加剧,并伴有下肢畸形,大多表现为髋关节屈曲、下肢短缩和外旋。对怀疑股骨颈骨折的患者查体时尽量避免行髋关节特殊查体,如“4”字征试验,以避免患者疼痛加剧、引起或加重骨折移位。

(二)影像学检查

X 线片是首选检查,包括含双侧髋关节的完整骨盆前后位 X 线片及伤侧髋关节的侧位 X 线片。对于怀疑髋部骨折的患者避免进行蛙式位 X 线片,以防止造成患者疼痛加剧及骨折移位。

CT 及二维(冠状面及矢状面)、三维影像重建可以全面、直观了解骨折形态特征,有助于手术方案的制定,特别是存在骨折移位、垂直不稳或粉碎的情况时^[9]。

当高度怀疑股骨颈骨折而 X 线片检查无法确诊时,建议行 CT 或 MRI 检查^[10-11],或短期(如 12 周内)严密随访并复查 X 线片。

此外,股骨干骨折伴发同侧股骨颈骨折的概率在不同文献报道中略有差异,但几乎都在 10% 以内^[12-13],多见于高能量损伤或多发伤^[14]。因为伴发于同侧股骨干骨折的股骨颈骨折多数为无移位或仅为微小移位,所以诊断困难,漏诊率高^[15]。对于年轻患者,一旦漏诊,可能导致股骨颈骨折二期移位^[16-17]。因此,建议急诊医师对此提高警惕,对诊断为股骨干骨折的患者除体检外,X 线片应常规包括同侧髋关节,必要时进行骨盆 CT 扫描^[17]。

二、分型

目前,用于指导股骨颈骨折治疗选择和预后判断的分型有多种,当前常用和文献报道的分型有:

(一)解剖部位分型

依据骨折线所累及的部位分为 3 种类型,即头下型:该型骨折股骨头血供损伤严重,因此骨折愈合困难,股骨头缺血性坏死发生率高,预后差^[18];经颈型:此类型常伴有颈下方骨折块,骨折闭合复位困难,复位后稳定性较差;基底型:骨折线位于颈基底部,复位后易保持稳定。骨折端血供良好,容易愈合,预后良好。

(二)Garden 分型

依据骨折移位的程度分为 4 种类型,即 I 型:不完全性或外展嵌插型骨折;II 型:无移位的完全性骨折;III 型:部分移位的完全性骨折;IV 型:完全性移位的骨折。

Garden 分型简单,但可信度较低^[19-21]。目前倾向于根据骨折是否存在移位,将其分为无移位骨折(Garden I、II 型)和移位骨折(Garden III、IV 型)。对于年轻患者,移位骨折的并发症发生率明显高于无移位骨折^[6]。

(三)Pauwels 分型

传统的 Pauwels 分型将股骨颈骨折远端骨折线与水平线之间的夹角定义为 Pauwels 角。依据 Pauwels 角度的大小将其分为 3 种类型^[22-23]:I 型:Pauwels 角 $\leq 30^\circ$;II 型:Pauwels 角为 $30^\circ \sim 50^\circ$;III 型:Pauwels 角 $\geq 50^\circ$ 。

Pauwels 分型可以评估骨折的稳定性,并预测骨折固定后的稳定程度。随着 Pauwels 角度增大,股骨颈骨折出现并发症的概率也增加^[23-24]。通常 Pauwels III 型股骨颈骨折在年轻股骨颈骨折的患者中较为常见,其治疗更为棘手,并发症率更高。有研究报道,Pauwels 角测量重复性差,Pauwels 分型可信度低^[25]。也有学者对 Pauwels 角度的测量方法进行了修正^[26-27]。

(四)其他分型

股骨颈骨折的 AO/OTA 分型常被用于研究当中^[28-29],分型相对复杂,临床实际应用意义有限。颈垂角(vertical of the neck axis, VN)及分型方法相对于 Pauwels 角及其分型更加稳定直接,可信度更高^[30-31]。

治 疗

一、治疗原则

保守治疗是治疗无移位股骨颈骨折(Garden I、II 型)的一种选择,特别是外翻嵌插型骨折。保守治疗过程中存在较高的骨折移位风险^[32],因此应保持定期随访,如果发生骨折移位,则按移位的股骨颈骨折及时处理。保守治疗也适用于身体情况差或合并有严重内科疾患无法耐受手术或主动选择保守治疗的患者^[33]。

对于绝大部分股骨颈骨折患者,首选手术治疗。手术方式的选择取决于骨折类型、移位程度、患者自身状况(年龄、骨质量)、伤前身体条件(伤前活动状态、合并症)等。

临床上,一般将年龄小于 65 岁的股骨颈骨折患者定义为“年轻患者”^[34],年龄大于 75 岁的患者定义为“老年患者”。而年龄在 65~75 岁之间的患者,应根据患者的伤前生理状态决定其属于“年轻患者”还是“老年患者”^[5,35]。当然,年龄只是一般性标准,治疗方案的选择还要考虑患者的整体身体状况、实际活动能力和预期功能要求。

对年轻患者或者骨骼条件较好的老年患者,手术治疗目标是尽量保留股骨头、避免股骨头坏死,并达到骨性愈合^[5],首选闭合或切开复位内固定治疗。解剖复位和有效固定对获得良好的预后及功能有重要意义^[36]。

对于骨骼质量较差的老年患者或合并疾病多的患者,为了避免或减少因长时间卧床可能带来的并发症,尽早恢复患者负重行走功能,首选髋关节置换(包括半髋关节置换和全髋关节置换)治疗。

二、早期处理

在等待手术期间,保持患肢于伤后自然状态。已证实,股骨颈骨折患者伤后关节囊内压增高,继而影响股骨头血供,即“填塞效应”^[37]。当髋关节伸直和内旋位时,髋关节囊内压最大;而髋关节屈曲及外旋位时,关节囊内压最小^[38-40]。

对于老年股骨颈骨折,不建议术前给予牵引^[41-43]。老年股骨颈骨折术前评估建议参考《中国老年髋部骨折患者麻醉及围术期管理指导意见》^[44]。

三、手术时机

对于股骨颈骨折,无论是老年患者还是年轻患者,绝大多数证据都支持尽早进行手术治疗。

对老年患者而言,入院 48 h 内手术治疗效果更好,可以减轻疼痛、降低并发症发生率、缩短住院时间^[41,45-47]。因此,只要老年患者的身体情况允许,应尽早手术^[48]。为提高老年股骨颈骨折的治疗效果和效率,建议在有条件的地区或单位探索建立老年髋部骨折救治“绿色通道”^[49]。对年轻股骨颈骨折患者,同样建议尽早手术治疗^[50-51]。

四、闭合复位还是切开复位

一般认为,股骨颈骨折复位不良是骨折愈合并发症(不愈合、延迟愈合、畸形愈合)、功能恢复受限、二期翻修手术的高危因素^[52-56]。因此,对拟接受内固定手术治疗的股骨颈骨折,应必须尽量做到解剖复位;若闭合复位无法达到可以接受的解剖复位,则应行切

开复位^[5,57-59]。骨折复位质量可以通过 C 型臂 X 线机进行评估。尝试闭合复位时避免使用暴力,复位次数应控制在 2~3 次^[60-61]。

传统的可供选择的切开入路包括:前方的 Smith-Peterson 入路、前外侧的 Watson-Jones 入路。直接前方入路(direct anterior approach, DAA)创伤更小,显露更直接^[62]。

五、术中复位质量评判

评估股骨颈骨折复位后的质量需以患侧股骨颈的标准前后位、侧位 X 线片为依据^[63-64]。目前常用的股骨颈骨折复位质量评判标准有 Garden 对线指数^[65]和 Lowell 曲线^[55]。

对股骨颈骨折应尽量达到解剖复位。如果无法获得完全的解剖复位,在可接受的范围内宁可实现轻微的外翻复位,避免内翻复位^[66]。

六、内固定方法的选择

根据作用机制的不同,用于股骨颈骨折治疗的内固定方式主要有以下几类:

(一)拉力螺钉固定

股骨颈骨折最为常用的固定方式是 3 枚平行拉力螺钉固定^[67],其优势在于动态滑动机制、方便实现微创植入、操作相对简单、保存骨量、保留股骨头血供等^[68-69]。3 枚拉力螺钉固定可以经皮或者切开置入,螺钉要尽量平行,尽可能贴着股骨颈皮质分散分布,以便实现最大拉力和滑动加压^[70]。推荐使用倒三角构型固定^[71-73]。

此外,还有偏轴螺钉固定(Off-axial)^[74-77]、F 型固定(双平面、双支撑点斜低位螺钉固定)^[78-80]等多种非平行螺钉固定方法。这些固定方法尚缺乏足够的临床循证医学证据,根据患者和骨折具体情况审慎选用。

(二)动力髋螺钉(dynamic hip screw, DHS)+抗旋转螺钉固定

DHS 固定股骨颈骨折的生物力学强度高于 3 枚拉力螺钉,其最佳适应证是基底型股骨颈骨折^[81]。此外还适用于 Pauwels III 型骨折或骨质疏松性骨折^[82-84]。DHS 不适用于头下型股骨颈骨折。

DHS 对股骨头颈仅单钉固定,抗扭转力量不够,建议联合使用抗旋转螺钉。抗旋转螺钉须与 DHS 滑动螺钉平行,以实现更好的滑动加压。建议将 DHS 滑动螺钉置入股骨矩区域而不是颈正中^[85],且滑动螺钉顶尖距(tip apex distance, TAD)控制在 25 mm 以内,以防止螺钉切出^[86-87]。

(三)髓内固定

股骨近端髓内钉也可以用于股骨颈骨折治疗,其适应证为股骨颈基底型骨折以及合并于股骨干的股骨

髓内钉用于股骨颈骨折固定时需要注意:①头螺钉螺纹必须跨越骨折线,以实现股骨颈骨折的加压;②置入髓内钉时避免引起或加重股骨颈骨折移位。

(四)特殊类型股骨颈骨折的内固定选择

垂直剪切型(如 Pauwels III 型)股骨颈骨折多见于年轻患者。由于骨折线的形态使得该类型骨折断端之间承受的剪切力极高,易发生骨折不愈合(16%~59%)和股骨头坏死(11%~86%)[9, 24, 88-89]。因此,对复位内固定的要求较高,是目前临床治疗中的难题。

当前用于垂直剪切型股骨颈骨折的治疗方法多种多样,据文献报道有单纯平行拉力螺钉、偏轴拉力螺钉、全螺纹螺钉、DHS、锁定板、股骨近端髓内钉、内侧支撑钢板、静力加压内侧支撑螺钉技术[90-96]等等。传统的 3 枚平行拉力螺钉固定并不能提供足够的稳定,其并发症发生率较高。文献报道其他方法有各自的生物力学优势[97-99],但都还需要更多的循证医学证据支持。

影响股骨颈骨折稳定性和内固定类型选择的因素很多。总而言之,选择何种内固定物取决于骨折的类型、骨折粉碎程度及部位、内固定物的机械特性以及骨科医生对内固定物的熟悉程度或偏好。此外,患者的骨质量、是否合并股骨干骨折等均会对内固定物的选择产生影响[100]。

七、关节置换的选择

对于老年不稳定型股骨颈骨折(Garden III 型和 IV 型)、无法接受长期卧床休养、对再次手术耐受性较差或极高龄患者(年龄大于 80 岁),推荐关节置换手术治疗[101-107]。对于老年无移位或外展嵌插的稳定型股骨颈骨折(Garden I 型和 II 型),也可以选择内固定治疗[46, 101]。

对预期寿命长、伤前活动量较大或术后功能要求高、同时合并髋臼骨关节炎、发育不良或其他本来就需要关节置换手术的髋臼病损的老年股骨颈骨折推荐采取全髋关节置换(Total hip arthroplasty, THA)治疗;而半髋关节置换(Hemiarthroplasty, HA)更适合高龄、活动要求低、身体情况欠佳的老年患者[4]。

对骨质较差,特别是骨皮质厚度纤薄的患者,推荐使用骨水泥型假体;而对骨质情况尚好、预期生存时间较长的患者,则推荐使用非骨水泥型假体[35]。

并 发 症

一、股骨颈短缩问题

股骨颈短缩会导致肢体短缩、髋外展肌力下降[108],并与患者的生存质量和翻修率成正相关,特别当短缩大于 5 mm,患者的生存质量明显受到影响[109-110],应尽量避免。

二、骨折愈合相关并发症的处理

建议参照《青壮年股骨颈骨折的显微外科治疗专家共识》[111]。

三、股骨头坏死的诊疗

建议参照《成人股骨头坏死诊疗标准专家共识(2012 年版)》[112]。

四、深静脉血栓预防

建议参照《创伤骨科患者深静脉血栓形成筛查与治疗的专家共识》[113]。

总 结

无论是年轻患者还是老年患者,股骨颈骨折都应尽量及早手术治疗。目前治疗股骨颈骨折的手术方法纷繁多样,无论内固定治疗还是关节置换治疗都应遵循各自的适应证慎重选择。

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参与指南制定专家(按姓氏拼音顺序):

安维军 毕郑刚 蔡善保 曹学成 曹 阳 曾炳芳 柴益民 陈 华 陈爱民 陈雁西 陈允震 陈 仲 程 鹏 池雷霆 党晓谦 丁真奇 樊国锋 方诗元
高 鹏 顾立强 郭荣光 郭晓山 郭 氧 侯志勇 黄富国 姬洪全 纪 方 贾世孔 贾燕飞 姜保国 蒋协远 荆珏华 孔 荣 李 军 李开南 李临齐
梁家利 廖 琦 林凤飞 林张源 刘 璠 刘光耀 刘国辉 刘 勇 刘 智 罗从凤 吕德成 吕 欣 马宝通 马信龙 倪江东 倪卫东 裴国献 戚 剑
芮永军 尚 剑 邵 林 史庆轩 孙大辉 孙玉强 孙月华 汤 欣 唐 坚 唐佩福 陶 然 田 耘 汪玉良 王爱国 王宝军 王 东 王 钢 王光林
王国选 王利民 王满宜 王鹏程 王秋根 文良元 郭 波 吴丹凯 吴多庆 吴克俭 吴新宝 肖德明 谢增如 谢 肇 徐 明 徐卫国 杨 军 杨 磊
杨明辉 姚 琦 叶发刚 余 斌 禹宝庆 袁 志 张 堃 张保中 张殿英 张建宁 张建政 张金利 张立海 张树明 张亚奎 张 一 张英泽 张长青
赵劲民 周东生 周 方 周君琳 朱仕文 朱 勇