

doi: 10.13241/j.cnki.pmb.2017.19.039

近端膨胀髓内钉与抗旋髓内钉治疗老年股骨转子间骨折的临床疗效分析*

张熙辉¹ 黄 胜² 周 理¹ 徐明奎¹ 曾德斌³

(1 海南省中医院 骨二科 海南 海口 570203; 2 海南医学院附属医院 骨科 海南 海口 570102;

3 海南省人民医院 显微手外科 海南 海口 570311)

摘要 目的:探究近端膨胀髓内钉与近端螺旋刀片抗旋髓内钉治疗老年股骨转子间骨折疗效及躁动发生率比较。**方法:**病例来源为 2012 年 5 月至 2013 年 10 月收入我院的老年股骨转子间骨折患者 60 例,采用随机数字表随机分为两组,膨胀钉组 30 例,采用近端膨胀髓内钉的手术方法,PFNA 组 30 例,采用近端螺旋刀片抗旋髓内钉的手术方法。手术结束后,对两组患者进行 X 射线片、手术时间及出血量、髋关节功能的比较,同时对比躁动发生率。**结果:**X 线检查结果显示两组患者经手术后骨折处均复位良好,无并发症及内固定物的脱落及松动,两组比较无显著差异($P>0.05$);与 PFNA 组相比,膨胀组患者的手术时间及出血量明显降低,差异具有统计学意义($P<0.05$);两组患者术后 3 个月、6 个月的 Harris 评分显示,与 PFNA 组相比,膨胀钉组的优良率明显升高,髋关节优于 PFNA 组,差异具有统计学意义($P<0.05$);膨胀钉组患者躁动率为 10.00 % 低于 PFNA 组患者躁动率为 33.33 %,具有统计学意义($P<0.05$)。**结论:**可膨胀髓内钉具有手术时间较短、出血量少,更利于骨折的愈合,且躁动发生率较低,对股骨转子间骨折的疗效优于近端螺旋刀片抗旋髓内钉,对临床有指导意义,值得临床推广。

关键词:近端膨胀髓内钉;近端螺旋刀片抗旋髓内钉;股骨转子间骨折;躁动发生率

中图分类号:R683 文献标识码:A 文章编号:1673-6273(2017)19-3754-04

The Proximal End of Expandable Intramedullary Nail and Proximal Femoral Nail Anti Rotation Blade in the Comparison of Therapeutic Effects of Intertrochanteric Fractures of Femur*

ZHANG Xi-hui¹, HUANG Sheng², ZHOU Li¹, XU Ming-kui¹, ZENG De-bin³

(1 Department of orthopedics, Hospital of Hainan traditional Chinese Medicine, Haikou, Hainan, 570203, China;

2 Department of orthopedics, Affiliated Hospital of Hainan Medical University, Haikou, Hainan, 570102, China;

3 Department of micro-surgery, hand surgery, Hainan Provincial People's Hospital, Haikou, Hainan, 570311, China)

ABSTRACT Objective: To explore the proximal end of expandable intramedullary nail and proximal femoral nail anti rotation blade in the curative effect of femoral intertrochanteric fractures. **Methods:** 60 cases of cases come from 2012 May to 2013 October in our hospital in patients with income, the cases with femoral intertrochanteric fracture in clinical diagnosis, were randomly divided into two groups, expansion nail group 30 cases, use proximal expansion operation method of intramedullary nail, 30 cases in group PFNA, using surgery methods the proximal femoral nail anti rotation blade. After the surgery, X - ray, the two groups of patients with operation time and bleeding volume, the function of hip joint. **Results:** X-ray examination showed the two groups after operation after fracture reduction were well off and loose, without complications and internal fixation, compared the two groups had no significant difference ($P>0.05$) compared with PFNA group, the expansion operation time groups of patients and the amount of bleeding decreased obviously, the difference has statistical significance ($P<0.05$). The patients in two groups after 3 months, 6 months of Harris score revealed that, compared with PFNA group, the excellent and good rate of expansion nail group increased significantly, the hip joint is better than that of PFNA group, with statistically significant difference ($P<0.05$). **Conclusion:** The expandable intramedullary nail has the advantages of shorter operation time, less bleeding, more conducive to fracture healing, the intertrochanteric fracture better than the more proximal femoral nail anti rotation blade, a guide for clinical significance, is worth the clinical promotion.

Key words: Proximal expandable intramedullary nail; Proximal femoral nail anti rotation blade; Intertrochanteric fracture; Agitation rate

Chinese Library Classification(CLC): R683 **Document code:** A

Article ID: 1673-6273(2017)19-3754-04

前言

股骨转子间骨折是髋部骨折中的常见骨折类型,发病率大于 50%,女性居多^[1]。由于其结构特殊,且老年人多骨质疏松,所

* 基金项目:海南省自然科学基金项目(30323)

作者简介:张熙辉(1982-),男,硕士研究生,主治医师,研究方向:骨科,电话:13379973388

(收稿日期:2016-12-20 接受日期:2017-01-15)

以其高发人群为老年人,近年来,随着我国人口老龄化的发展,其发病率逐年增高^[2]。股骨转子间骨折常合并股骨距的破坏,常规的保守治疗虽可能治愈,但由于其长期卧床等缺点,可能会导致多种并发症甚至死亡的发生。故为减少各种并发症,降低死亡率,早日使其复位,加强功能锻炼,早期手术的治疗方案已被广为接受^[3]。目前临床主要采用髓外固定及髓内固定两种方式治疗,但髓外固定比髓内固定的力臂长,所受弯曲力矩大,其动静加压的作用使髓内固定的稳定性优于髓外固定,患者可以尽早行走,减少并发症的发生。可膨胀髓内钉是一种新型髓内固定系统,由合金柱状薄管和径向辐条构成该钉的主体,其形状与骨髓腔的弯曲保持一致^[4]。可膨胀髓内钉的特殊之处在于当髓内钉内注水后,髓内钉膨胀增粗,与髓腔紧密嵌合,取消扩髓和交锁的过程,减少手术创伤,减少并发症,是一种较好的疗法。近端螺旋刀片抗旋髓内钉定位装置精确,稳定性较高,螺

旋刀片锁紧后在骨骼上有较强的锚固力,防止螺钉向股骨头内侧滑移,阻止股骨近端旋转,显著提高了抗拔出及抗切割能力。其操作方法简单,属于微创操作,所以在临床上得到了广泛应用。因此,为减少患者痛苦,确切提高疗效,增加治愈率,本文对近端膨胀髓内钉与近端螺旋刀片抗旋髓内钉两种疗法进行对比分析,现报道如下。

1 资料与方法

1.1 一般资料

病例来源为 2012 年 5 月至 2013 年 10 月收入我院的老年股骨转子间骨折患者 60 例,采用随机数字表随机分为膨胀钉组和 PFNA 组,每组各 30 例,两组患者的年龄、性别比例、骨折类型及骨折至手术时间等一般资料无明显差异($P < 0.05$),具有可比性,具体见表 1。

表 1 两组患者一般情况表($\bar{x} \pm s$)
Table 1 General situation of patients in the two groups($\bar{x} \pm s$)

Groups	Cases	Average age	male / female	The type of fracture			Time to fracture operation(month)
				A1	A2	A3	
Bolts group	30	74.37 $\pm$ 4.37	15/15	12	7	11	4.8 $\pm$ 1.2
PFNA group	30	76.63 $\pm$ 3.76	17/13	10	9	11	5.0 $\pm$ 0.9

1.2 术前准备

术前对两组患者的各脏器功能进行全面检查,治疗控制基础疾病,并根据既往史及检查结果进行相关的科室会诊,评估患者的全身情况,对符合手术指征的患者术前行骨或皮肤牵引,并进行常规抗生素治疗。

1.3 手术方法

膨胀钉组:选择硬膜外或全身麻醉,采用平卧位,在牵引床上在 C 型臂透视下进行牵引复位,消毒,自大转子尖向股骨头方向近端做 3-5 cm 的切口,用三棱锥自大转子尖内侧臀中肌前部向股骨髓腔方向进入 0.5 cm,透视见位置方向正确,插入导针,除髓腔外,用弹性钻扩大入口。将可膨胀钉插入髓腔内。通过瞄准器,在股骨大转子尖部稍偏内侧向股骨颈中下 1/3,拧入导针,位于股骨颈正中,沿导针方向,用合适尺寸的空心钻头钻孔,向股骨近端插入股骨头栓钉。之后取出导针、钻头。连接上压力泵,抽吸生理盐水,注入钉内,监测膨胀压力。见钉头部膨胀成橄榄形为止。再将导针连接压力泵,膨胀钉干,见骨折侧方移位也完全复位,启动滑动限制器。取下定位器,拆除压力泵和瞄准器,旋入导钉帽。冲洗后再缝合手术切口。

PFNA 组:患者采用连续硬膜外或全身麻醉,仰卧位,患侧稍垫高,约束带固定上身。复位。切口起自大转子顶点上 2 cm 根据患者胖瘦纵向向近侧延伸 3-6 cm,于大转子尖端前中 1/3 处开口,暴露臀中肌纤维。于大转子顶点钻入开口导针,至股骨髓腔,套入保护套筒。钻入联合钻以扩大股骨近端,插 PFNA 主钉,根据定位器再钻入 1 枚带螺纹导针,将螺旋刀片敲入股骨头内,透视满意,锁定螺旋刀片,复位满意后静态锁定远端螺钉,近端安装尾帽,缝合切口,常规引流。

1.4 观察指标及检测方法

1.4.1 X 射线片 两组患者治疗前后行 X 线检查,了解患者骨折愈合、复位情况,有无固定物松动及并发症的发生。

1.4.2 髋关节功能 采用 Harris 评分评定患者手术后 3 个月、6 个月的髋关节功能^[5]。包括疼痛、功能活动、畸形发生情况、运动范围满分 100 分,90-100 为优,80-89 为良,70-79 为中,低于 70 为差。

1.5 统计学方法

采用 SPSS19.0 统计学软件进行统计学分析,计量资料采用 t 检验,以 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 X 线片结果比较

X 线检查结果显示两组患者经手术后骨折处均复位良好,无并发症及内固定物的脱落及松动,两组比较无显著差异($P > 0.05$),见图 1,图 2。

2.2 手术时间及出血量比较

膨胀组患者的手术时间(59.25 $\pm$ 16.32)及出血量(119.74 $\pm$ 28.27)明显低于 PFNA 组手术时间(72.63 $\pm$ 19.69)及出血量(163.37 $\pm$ 34.82),差异具有统计学意义($P < 0.05$)。

2.3 Harris 评分比较

两组患者术后 3 个月、6 个月的 Harris 评分显示,与 PFNA 组相比,膨胀钉组的优良率明显升高,髋关节优于 PFNA 组,差异具有统计学意义($P < 0.05$),具体见表 3。

2.4 两组患者躁动率水平比较

膨胀钉组患者躁动率为 10.00%(3/30),PFNA 组患者躁动率为 33.33%(10/30),PFNA 组躁动率高于膨胀钉组,差异具有统计学意义($P < 0.05$)。

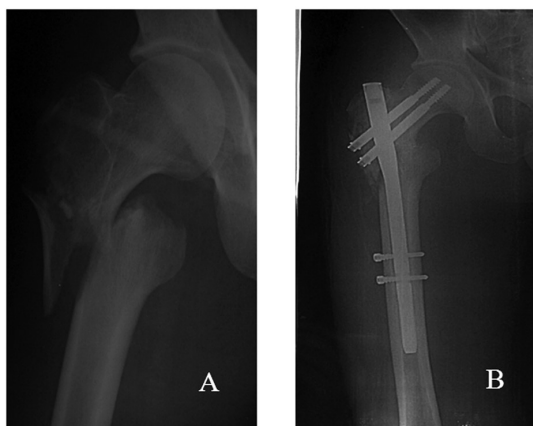


图 1 膨胀组患者治疗前后 x 线检查结果(A:治疗前 B:治疗后)

Fig.1 Proximal expansion nail X-ray examination results before and after the patients treated by intramedullary (A: before treatmentB:after treatment)

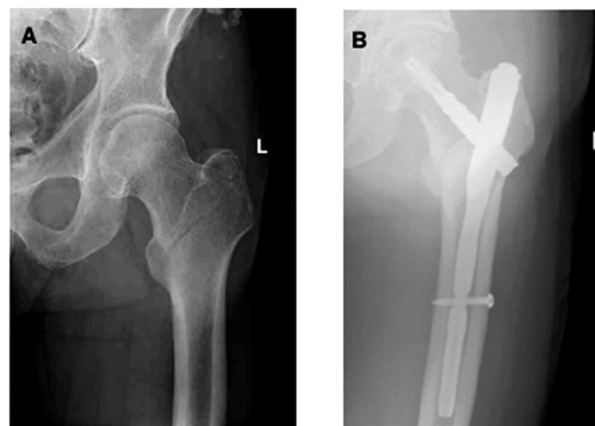


图 2 PFNA 组患者治疗前后 x 线检查结果(A:治疗前 B:治疗后)

Fig.2 X-ray examination results before and after PFNA treatment groups (A:before treatment B: and after treatment)

表 2 两组患者手术时间及出血量比较($\bar{x} \pm s$)

Table 2 Comparison of the operation time and bleeding volume between the two groups($\bar{x} \pm s$)

Groups	Cases	Operation time(min)	The amount of bleeding(ml)
Bolts group	30	59.25± 16.32*	119.74± 28.27**
PFNA group	30	72.63± 19.69	163.37± 34.82
t		2.481	2.632
P		0.024	0.018

表 3 两组患者术后 Harris 评分比较($\bar{x} \pm s$)

Table 3 Comparison of Harris score in patients of two groups after operation($\bar{x} \pm s$)

		Bolts group	PFNA group
3 months after operation	Excellent	19	19
	Good	8	8
	Medium	2	2
	Bad	1	2
	The excellent and good rate(%)	90.0*	86.67
6 months after operation	Excellent	23	21
	Good	5	6
	Medium	1	2
	Bad	1	1
	The excellent and good rate(%)	93.33*	90.0

Note: compared with PFNA group, P<0.05.

表 4 两组患者躁动率水平比较($\bar{x} \pm s, \%$)

Table 4 Comparison of the level of agitation rate between the two groups

Groups	Cases	Not stir the number of cases	Stir the number of cases	Agitation rate
Bolts group	30	27	3	3(10.00%)
PFNA group	30	20	10	10(33.33%)
χ^2				4.812
P				0.028

Note: compared with PFNA group, P<0.05.

3 讨论

股骨转子间的骨折多发生于 50 岁以上老年患者，老年人

由于年龄较大,常合并内科系统疾病,心肺等代偿功能较差,易发生严重并发症,甚至危及生命,手术风险较大。而早期手术治疗可有效愈合骨折,复原骨折部位的解剖关系,为后期功能提

供有力基础,然而老年人骨质疏松,骨质量和强度较低,固定器在骨上的锚固力降低,稳定性较差,进而导致手术失败^[6]。因此缩短手术时间,减少手术创伤及围手术期带来的各种并发症,避免畸形愈合被骨科医生广为关注,决定手术成败的关键点是内固定方法和固定置入位置,其中至关重要是内固定方法^[7,8]。因此,本实验通过近端膨胀髓内钉与近端螺旋刀片抗旋髓内钉两种疗法的临床效果进行比较,结果发现可膨胀髓内钉各项特点及临床恢复的效率均优于近端螺旋刀片抗旋髓内钉。朱剑^[9]回顾性分析 44 例应用股骨近端螺旋刀片抗旋髓内钉置入内固定的患者资料,发现 44 例患者骨性愈合时间大约需要 5 个月左右,其髋关节恢复优良率达到了 96%,说明股骨近端螺旋刀片抗旋髓内钉置入治疗各型股骨转子间骨折均有较为显著的临床效果,尤其对粉碎性或骨质较差的骨质疏松老年股骨转子间骨折具有更加显著的适用性,且创伤小。这是因为 PFNA 根据近端髓腔设计,远端特殊凹槽的设计特点,分散股骨干部所受的应力,有效防止应力过于集中导致断钉情况的发生^[10]。国外学者 Bobyn^[11]的研究结果也再次证实了髓内钉置入治疗的临床疗效,其应用效果显著,且螺旋刀片和骨的接触面积宽大,能有效防止旋转及塌陷,提高其稳定性,增加抗切出区域。但是也有学者^[12]提出,PFNA 的弧度及长度不适用于股骨干弧度较大的患者,因为这类患者操作时进钉困难或术后股骨远端容易再发骨折。但对于严重骨质疏松,大转子粉碎骨折,分离较大等这些复位困难的骨折患者,骨折端置钉操作困难,加压力不足,导致手术时间延长和术中出血量增多,螺旋刀片产生的锚合力不足,患者术后不能进行早期复健活动,容易发生切割股骨头颈而发生脱钉等不良后果。可膨胀髓内钉进入髓腔时是压缩直径状态,通过压力泵对其加压,排除髓腔直径的个体差异,主钉沿髓腔的形状膨胀,髓内钉的径向辐条与髓腔内壁都能紧密的贴合在一起,形成髓腔内自锁效应,均匀分布整个骨干的应力^[13]。Mann^[14]研究结果显示,可膨胀髓内钉在老年股骨转子间骨折治疗中体现出更加安全的应用优势,其优良率达到 89.74%,且骨折愈合所需时间较短,有助于促进患者早期康复。股骨头栓钉插入时用直径 8 mm 骨钻开孔,但膨胀后可以达到 12 mm,可通过动态加压的方式使周围骨质使疏松骨质更紧密坚实。Cicek^[15]认为,可膨胀髓内钉治疗避免了近端髓内钉扩髓伤害,降低髓内血液供应的破坏,做到最大面积的固定,展开的矩形状截面增加了其抗旋转性,大大增加了老年骨质疏松患者的适用性。本研究表明,可膨胀髓内钉具有手术时间较短、出血量少,躁动发生率较低等优点,且不需扩髓及远端锁钉,符合生物力学原则,更利于骨折的愈合,各项优势均好于 PFNA 组,再次证实可膨胀髓内钉在股骨转子间骨折治疗中的良好应用效果,提示可膨胀髓内钉治疗具有较高的有效性和安全性。

综上所述,可膨胀髓内钉创伤小、恢复快,对股骨转子间骨折的疗效优于较近端螺旋刀片抗旋髓内钉。

参考文献(References)

- [1] 刘强. 人工髋关节置换术在股骨粗隆间骨折治疗中的选择[J]. 中国骨与关节损伤杂志, 2009, 24(9): 770-770
- [2] Yoon B H, Lee Y K, Kim S C, et al. Epidemiology of proximal femoral fractures in South Korea[J]. Archives of osteoporosis, 2013, 8 (1-2): 1-5
- [3] Zhao JX, Su XY, Zhao Z, et al. Radiographic analysis of treatment of inter-trochanteric fractures using proximal femoral nails [J]. Beijing Da Xue Xue Bao, 2015, 47(2): 263-268
- [4] Imerci A, Canbek U, Karatosun V, et al. Nailing or plating for sub-trochanteric femoral fractures: a non-randomized comparative study [J]. Eur J Orthop Surg Traumatol, 2015, 25(5): 889-894
- [5] Xu Z, Zhang M, Yin J, et al. Redispacement after reduction with intramedullary nails in surgery of intertrochanteric fracture: cause analysis and preventive measures [J]. Arch Orthop Trauma Surg, 2015, 135(6): 751-758
- [6] Li J, Cheng L, Jing J. The Asia proximal femoral nail antirotation versus the standard proximal femoral antirotation nail for unstable intertrochanteric fractures in elderly Chinese patients [J]. Orthop Traumatol Surg Res, 2015, 101(2): 143-146
- [7] Carneiro M B, Alves D P L, Mercadante M T. Physical therapy in the post-operative of proximal femur fracture in elderly: Literature review [J]. Acta ortopedica brasileira, 2013, 21(3): 175-178
- [8] 梁绍兴. 股骨粗隆间骨折治疗的进展 [J]. 医药前沿, 2012, 02(14): 368-369
- [9] 朱剑. 股骨近端螺旋刀片抗旋髓内钉置入治疗老年骨质疏松性股骨转子间骨折 [J]. 中国组织工程研究与临床康复, 2010, 14(52): 9857-9860
- [10] Liang Shao-xing. The progress of the treatment of intertrochanteric fracture [J]. Journal of medical frontier, 2012, 02(14): 368-369
- [11] Zhu Jian. Femoral proximal screw blade anti rotary intramedullary nail in treatment of senile osteoporotic femoral fractures between rotor [J]. China tissue engineering research and clinical rehabilitation, 2010, 14(52): 9857-9860
- [12] Harrie Weinans, Dale R. Sumner, Ruben Igloria, et al. Sensitivity of periprosthetic stress-shielding to load and the bone density-modulus relationship in subject-specific finite element models [J]. Journal of Biomechanics, 2012, 33(5): 809-817
- [13] Bobyn J D, Mortimer ES, Glassman AH, et al. Producing and avoiding stress shielding[J]. Clin OrthoP, 2002, 274: 79-96
- [14] Oguuz Kayabasi, Harris WH, Fehmi Erzincanli, et al. Finite element modelling and analysis of a new cemented hip prosthesis [J]. Advances in Engineering Software, 2012, 37(2): 477-483
- [15] Zhang J, Ang ML, Kwek EB. Who Will Walk Again? Effects of Rehabilitation on the Ambulatory Status in Elderly Patients Undergoing Hemiarthroplasty for Femoral Neck Fracture [J]. Geriatr Orthop Surg Rehabil, 2015, 6(3): 168-172
- [16] Mann T, Eisler T, Boden H, et al. Larger femoral periprosthetic bone mineral density decrease following total hip arthroplasty for femoral neck fracture than for osteoarthritis: a prospective, observational cohort study[J]. J Orthop Res, 2015, 33(4): 504-512
- [17] Cicek H, Seyfettinoglu F, Kilicarslan K, et al. What should be the preferred choice of hemiarthroplasty technique in American Society of Anesthesiologists (ASA) class III patients with femoral neck fractures? Cemented or cementless[J]. Injury, 2015, 46(8): 1567-1570

- [4] Sameer Trikha, Shamira A. Perera, Rahat Husain. The role of lens extraction in the current management of primary angle-closure glaucoma[J]. Current Opinion in Ophthalmology, 2016, (5): 25-28
- [5] Masahiro Maeda, Mitsunori Watanabe, Kazuo Ichikawa. Goniosynechialysis Using an Ophthalmic Endoscope and Cataract Surgery for Primary Angle-closure Glaucoma [J]. Journal of Glaucoma, 2016, (12): 220-225
- [6] Shrivastava A, Singh K. The impact of cataract surgery on glaucoma care[J]. Current opinion in ophthalmology, 2014, 25(1): 19-25
- [7] 王亚尼,孙伟,谢立信,等.参考解剖学特征选择三种手术方式治疗 PACG 的临床观察 [J]. 中华眼视光学与视觉科学杂志, 2014, 16 (10): 589-593
Wang Ya-ni, Sun Wei, Xie Li-xin, et al. Select the reference anatomical characteristics of three kinds of surgical treatment of PACG[J]. Chinese Journal of clinical observation of eye optics and Visual Sciences, 2014, 16(10): 589-593
- [8] Sameer Trikha, Shamira A. Perera, Rahat Husain, et al. The role of lens extraction in the current management of primary angle-closure glaucoma[J]. Current Opinion in Ophthalmology, 2015, 14(2): 21-24
- [9] Masahiro Maeda, Mitsunori Watanabe, Kazuo Ichikawa. Goniosynechialysis Using an Ophthalmic Endoscope and Cataract Surgery for Primary Angle-closure Glaucoma.Masahiro Maeda [J]. Journal of Glaucoma, 2014, 6(3): 32-35
- [10] 冯珂,郭海科,张英朗.白内障术前两种角膜散光标记方法的对比研究[J].眼科新进展, 2016, 12(08): 168-172
Feng Ke, Guo Hai-ke, Zhang Ying-lang. Before cataract surgery two comparison of corneal astigmatism marker method[J]. New advances in ophthalmology, 2016, 12(08): 168-172
- [11] 李媚,曾阳发,杨晔等.白内障手术对滤过术后的原发性闭角型青光眼前房深度和晶状体位置的影响[J].眼科, 2014, 20(1): 28-33
Li Mei, Zeng Yang-fa, Yang Ye, et al. Effects of cataract surgery on anterior chamber depth and lens position of primary angle closure glaucoma after filtering surgery[J]. Eye, 2014, 20(1): 28-33
- [12] Andrew JR White, Justo Manuel A Orros, Paul R Healey. Outcomes of combined lens extraction and goniosynechialysis in angle closure [J]. Clin Experiment Ophthalmol, 2016, (8): 38-43
- [13] 李世玮,吴强,陆斌,等.应用 UBM 观察白内障摘除联合小梁切除术眼前节结构变化[J].中国实用眼科杂志, 2014, 29(12): 1240-1244
Li Shi-wei, Wu Qiang, Lu Bin, et al. Application of UBM to observe the changes of anterior segment structure in cataract extraction combined with trabeculectomy [J]. Chinese Journal of Practical Surgery, 2014, 29(12): 1240-1244
- [14] Travis J. Good, Malik Y. Kahook. Assessment of Bleb Morphologic Features and Postoperative Outcomes After Ex-PRESS Drainage Device Implantation Versus Trabeculectomy [J]. American Journal of Ophthalmology, 2013, 25(3): 45-48
- [15] 胡宏阁,王钰清.超声乳化白内障吸出术联合房角分离术治疗闭角型青光眼合并年龄相关性白内障的疗效观察[J].眼科新进展, 2016, 37(5): 35-40
Hu Hong-ge, Wang Yu-qing. Phacoemulsification and intraocular lens implantation combined with goniosynechialysis observation of curative effect of the treatment of angle closure glaucoma with cataract Hongge [J]. New advances in ophthalmology, 2016, 37(5): 35-40
- [16] Peter A. Netland, Steven R. Sarkisian, Marlene R, et al. Prospective, Comparative Trial of EX-PRESS Glaucoma Filtration Device versus Trabeculectomy (XVT Study)[J]. American Journal of Ophthalmology, 2015, 15(2): 15-19
- [17] Razeghinejad MR, Fudenberg SJ, Spaeth GL. The Changing Conceptual Basis of Trabeculectomy: A Review of Past and Current Surgical Techniques[J]. Surv Ophthalmol, 2015, 57(1): 1-25
- [18] Salim S. The Role of the Ex-PRESS Glaucoma Filtration Device in Glaucoma Surgery[J]. Semin Ophthalmol, 2016, 28(3): 180-184
- [19] Andrew JR White, Justo Manuel A Orros, Paul R Healey. Outcomes of combined lens extraction and goniosynechialysis in angle closure [J]. Andrew JR White, Justo Manuel A Orros, Paul R Healey [J]. Clin Experiment Ophthalmol, 2016, 18(8): 152-154
- [20] De Jong L, Lafuma A, Aguadé AS, et al. Five-year extension of a clinical trial comparing the EX-PRESS glaucoma filtration device and trabeculectomy in primary open-angle glaucoma[J]. Clin Ophthalmol, 2011, 5(8): 527-533

(上接第 3757 页)

- [16] Li J, Cheng L, Jing J. The Asia proximal femoral nail antirotation versus the standard proximal femoral antirotation nail for unstable intertrochanteric fractures in elderly Chinese patients [J]. Orthop Traumatol Surg Res, 2015, 101(2): 143-146
- [17] Ahmed E, Ibrahim el-G, Ayman B. Total hip arthroplasty with subtrochanteric osteotomy in neglected dysplastic hip [J]. Int Orthop, 2015, 39(1): 27-33
- [18] Ricci WM, Streubel PN, Saam M. Risk Factors for Failure of Locked Plate Fixation of Distal Femur Fractures: An Analysis of 335 Cases [J]. Journal of Orthopaedic Trauma, 2014, 28(2): 83-89
- [19] Rogmark C, Fenstad AM, Leonardsson O, et al. Posterior approach and uncemented stems increases the risk of reoperation after hemiarthroplasties in elderly hip fracture patients [J]. Acta Orthop, 2014, 85(1): 18-25
- [20] Oh I-H, Nomura N, Masahashi N, et al. Mechanical properties of porous titanium compacts prepared by powder sintering [J]. Scripta Materialia, 2013, 49(5): 1197-1200