

海绵颗粒可以作为该治疗中首选的栓塞材料。

[参考文献]

- [1] Abujudeh H, Mirsky D. Traumatic high-flow priapism: treatment with super-selective micro-coil embolization [J]. Emerg Radiol, 2005, 11: 372 - 374.
- [2] Merlob P, Livne PM. Incidence, possible causes and followup of idiopathic prolonged penile erection in the newborn [J]. J Urol, 1989, 141: 1410 - 1412.
- [3] Majeed S, Schor JA, Jacobson S, et al. Refractory priapism of unknown etiology in a pediatric patient[J]. Pediatr Emerg Care, 2000, 16: 347 - 351.
- [4] Pryor J, Akkus E, Alter G, et al. Priapism [J]. J Sex Med, 2004, 1: 116 - 120.
- [5] Keck B, Lotter G, Wieland WF, et al. Sonographic diagnosis of a posttraumatic arteriocavernosal fistula resulting in high-flow priapism[J]. J Clin Ultrasound, 2012, 40: 60 - 62.
- [6] Hatzichristou D, Salpiggidis G, Hatzimouratidis K, et al. Management strategy for arterial priapism: therapeutic dilemmas [J]. J Urol, 2002, 168: 2074 - 2077.
- [7] Kuefer R, Bartsch G, Herkommer K, et al. Changing diagnostic and therapeutic concepts in high-flow priapism [J]. Int J Impot Res, 2005, 17: 109 - 113.
- [8] Bastuba MD, Saenz de Tejada I, Dinlenc CZ, et al. Arterial priapism: diagnosis, treatment and long-term followup [J]. J Urol, 1994, 151: 1231 - 1237.
- [9] Numan F, Cantasdemir M, Ozbayrak M, et al. Posttraumatic nonischemic priapism treated with autologous blood clot embolization[J]. J Sex Med, 2008, 5: 173 - 179.
- [10] Kress O, Heidenreich A, Klose KJ, et al. Superselective embolization with coils in high-flow priapism [J]. Cardiovasc Intervent Radiol, 2002, 25: 326 - 329.
- [11] 邹英华, 郭中恒, 辛忠诚, 等. 微圈栓塞海绵体动脉瘘治疗外伤性阴茎异常勃起的疗效评价 [J]. 介入放射学杂志, 2008, 17: 700 - 702.
- [12] Liu BX, Xin ZC, Zou YH, et al. High-flow priapism: superselective cavernous artery embolization with microcoils[J]. Urology, 2008, 72: 571 - 573.
- [13] Cantasdemir M, Gulsen F, Solak S, et al. Posttraumatic high-flow priapism in children treated with autologous blood clot embolization: long-term results and review of the literature[J]. Pediatr Radiol, 2011, 41: 627 - 632.
- [14] Pieri S, Agresti P, La Pera G, et al. Post-traumatic high flow priapism percutaneously treated with transcatheter embolisation [J]. Radiol Med, 2005, 110: 370 - 377.
- [15] 敖劲, 张跃伟, 徐克. 明胶海绵微粒经动脉栓塞治疗原发性肝癌的研究现状 [J]. 介入放射学杂志, 2011, 20: 1010 - 1013.

(收稿日期:2013-07-02)

(本文编辑:侯虹鲁)

• 临床研究 Clinical research •

骨盆肿瘤术前栓塞对骨科手术后切口愈合的影响

刘向东, 赵家宁, 吴文娟, 张国川

【摘要】 目的 探讨骨盆肿瘤术前栓塞对骨科手术后切口愈合的可能影响机制。**方法** 收集 2000 年 1 月—2012 年 12 月骨盆肿瘤患者 119 例,在骨盆肿瘤术前先行栓塞,观察骨科手术后切口愈合情况。119 例中,65 例栓塞材料以明胶海绵颗粒和明胶海绵条为主,为海绵组;54 例栓塞材料以弹簧钢圈为主、明胶海绵条为辅,为钢圈组。分别统计两组骨科手术后发生切口延迟愈合及不愈合患者的例数,并比较组间差异有无统计学意义。**结果** 骨科手术后,海绵组切口延迟愈合及不愈合 11 例,发生率为 16.9%(11/65);钢圈组切口延迟愈合及不愈合 2 例,发生率为 3.7%(2/54),组间差异有统计学意义($P < 0.05$)。**结论** 末梢血管床的栓塞可能是骨盆肿瘤术前栓塞导致骨科手术后切口延迟愈合及不愈合的重要原因,通过改变栓塞材料有效的保护末梢血管床可以明显降低骨科手术后切口延迟愈合及不愈合的发生率。

【关键词】 骨盆肿瘤; 栓塞; 切口愈合; 末梢血管

中图分类号:R738.1 文献标志码:B 文

DOI:10.3969/j.issn.1008-794X.2014.04.017

作者单位: 050051 石家庄 河北医科大学第三医院放射科介入治疗室、河北省骨科生物力学重点实验室(刘向东、赵家宁、吴文娟),骨与软组织肿瘤科(张国川)

通信作者: 吴文娟 E-mail: wenjwu@163.com

章编号:1008-794X(2014)-04-0340-03

Influence of preoperative embolization on incision healing after orthopedic surgery in patients with pelvic tumors: analysis of 119 cases

LIU Xiang-dong, ZHAO Jia-ning, WU Wen-juan, ZHANG Guo-chuan. Department of International Radiology, the Third Hospital, Hebei Medical University, Shijiazhuang, Hebei Province 050051, China

Corresponding author: WU Wen-juan, E-mail: wenjuwu@163.com

【Abstract】 Objective To explore the possible mechanism of delayed wound healing and unhealed incision after orthopedic surgery in patients with pelvic tumor receiving preoperative embolization, and to discuss the methods to reduce the incidence of delayed incision healing and non-healing wounds. **Methods** A total of 119 patients with pelvic tumors, who were encountered at authors' hospital during the period from Jan. 2001 to Dec. 2012, were collected for this study. Preoperative embolization was employed before orthopedic surgery. The wound healing condition after the surgery was retrospectively analyzed. Of 119 patients, gelatin sponge particles and strips used as main embolic material were employed in 65 (sponge group) and steel coils used as main embolic material together with sponge strips as supplementary embolization material were adopted in 54 (steel coil group). The incidences of delayed wound healing and unhealed incision were calculated and the results were compared between the two groups. **Results** After the orthopedic surgery the incidences of delayed wound healing and unhealed incision in the sponge group and the steel coil group were 16.92% (11/65) and 3.70% (2/54) respectively, the difference between the two groups was statistically significant ($\chi^2 = 4.025\ 6$, $P < 0.05$). **Conclusion** The obstruction of peripheral vascular bed after preoperative embolization therapy may be an important factor that causes delayed wound healing and unhealed incision after orthopedic surgery in patients with pelvic tumor. The incidence of delayed wound healing and unhealed incision after orthopedic surgery can be significantly reduced by changing embolization materials to effectively protect the peripheral vascular bed. (J Intervent Radiol, 2014, 23: 340-342)

【Key words】 pelvic tumor; embolization; incision healing; peripheral vessel

骨盆肿瘤的术前栓塞可以较大地减少骨科手术中的出血,这一观点已被大多数骨科医师认可并接受,所以实施骨盆肿瘤术前栓塞的患者逐渐增多^[1-3]。在骨科手术后的临床随访中,我们发现较为多见的是手术切口的延迟愈合和不愈合。本文报道我院119例骨盆肿瘤术前栓塞患者手术切口延迟愈合和不愈合情况。

1 材料与方法

1.1 临床资料

收集 2000 年 1 月—2012 年 12 月骨盆肿瘤术前栓塞患者 119 例,其中男 68 例,女 51 例,年龄 12 ~ 84 岁。肿瘤位于髂骨 62 例、骶骨 37 例、耻骨 13 例、坐骨 7 例。病理类型为软组织肉瘤 24 例,成骨肉瘤 18 例,恶性纤维组织细胞瘤 16 例,巨细胞瘤 15 例,脊索瘤 13 例,恶性淋巴瘤 9 例,骨髓瘤 8 例,转移瘤 8 例,尤文肉瘤 5 例,血管肉瘤 2 例,脂肪肉瘤 1 例。按栓塞材料不同分为海绵组 65 例和弹簧钢圈组 54 例。

1.2 方法

采用 Seldinger 法股动脉入路,在 AngioStar 3000 血管造影机下行单侧髂内动脉或双侧髂内动脉及其分支栓塞,海绵组栓塞材料以明胶海绵颗粒和明胶海绵条为主,钢圈组以弹簧钢圈为主、明胶海绵条为辅。分别统计两组骨科手术后发生切口延迟愈合及不愈合患者数,并比较两组发生率有无统计学意义。

1.3 统计学方法

采用 SPSS17.0 软件行统计学分析,组间比较采用 χ^2 检验。 $P < 0.05$ 为差异有统计学意义。

2 结果

骨科手术后,海绵组 65 例切口延迟愈合及不愈合 11 例,发生率为 16.9% (11/65);钢圈组 54 例切口延迟愈合或不愈合 2 例,发生率为 3.7% (2/54),组间差异有统计学意义 ($\chi^2 = 4.025\ 6$, $P < 0.05$),见表 1。

3 讨论

骨盆肿瘤术前栓塞引起骨科术后延迟愈合及

表 1 两组栓塞材料对手术切口延迟愈合或不愈合发生率比较

组别	切口延迟愈合或不愈合		发生率(%)
	无	有	
海绵组(65 例)	54	11	16.92
钢圈组(54 例)	52	2	3.70

不愈合与术前肿瘤的栓塞程度有较大关系^[4-6]。不同的介入科医师对骨盆肿瘤术前栓塞程度的操作存在较大差异,即使同一介入科医师对不同骨盆肿瘤术前的栓塞程度操作也有很大差异。而栓塞程度与栓塞材料的选择及栓塞范围的控制有很大关系^[7-8]。在临床随访中,我们发现骨盆肿瘤栓塞后出现骨科术后切口延迟愈合和不愈合可能与使用明胶海绵颗粒有关,明胶海绵颗粒的使用可能与末梢血管床的栓塞有关。明胶海绵颗粒在生理盐水中浸泡时间稍长后颗粒会变成胶样物质,这种胶样物质会较大地栓塞末梢血管床从而破坏末梢血管床的微循环。末梢血管床是由末梢小动脉、毛细血管、末梢小静脉组成。末梢血管床的破坏带来的后果就是即使有足够的侧支交通动脉开放也不能为皮肤及皮下组织这些属于末梢血管供血的组织提供足够的血供^[9-11]。可能正因如此,海绵组骨科手术后 11 例出现切口延迟愈合和不愈合。按照以上分析,我们对于栓塞材料以及对栓塞血管的范围做了以下调整。将原来使用明胶海绵颗粒、明胶海绵条为主的栓塞材料调整为以使用栓塞弹簧钢圈为主、明胶海绵条为辅,由栓塞髂内动脉分支动脉及末梢血管调整为栓塞髂内动脉主干。通过调整栓塞材料、栓塞范围,尽可能保护末梢血管床,所以在钢圈组中仅 2 例发生骨科手术后切口延迟愈合及不愈合,且可能与弹簧钢圈用量不足,明胶海绵条可能穿过钢圈碎裂后栓塞末梢血管床有关。另外,手术切口的延迟愈合及不愈合不仅仅是皮肤及皮下软组织末梢血管床被栓塞的表象,实际上在手术部位的内部同样存在此问题。在骨科手术中,海绵组术中可见有的患者创面略显灰白、出血量较少、肿瘤组织有的呈豆腐渣样改变,有时术者用手就可以把肿瘤组

织抠下来,在钢圈组患者则很少出现这种情况,虽然出血量较海绵组略显增多,但对手术术野及操作影响不大。钢圈组由于较好的保护了末梢血管床,故对术后的创面愈合及手术切口愈合影响不大。

[参 考 文 献]

- [1] Campbell CA, Chang DW. Vascularized femur flap for stabilization after combined total sacrectomy and external hemipelvectomy [J]. *Plast Reconstr Surg*, 2012, 129: 888e - 889e.
- [2] Arkader A, Yang CH, Tolo VT. High long-term local control with sacrectomy for primary high-grade bone sarcoma in children [J]. *Clin Orthop Relat Res*, 2012, 470: 1491 - 1497.
- [3] 刘玉金, 杨仁杰, 张秀美, 等. 骨盆骨肿瘤的介入治疗[J]. 介入放射学杂志, 2007, 16: 232 - 234.
- [4] Li GD, Fu D, Chen K, et al. Surgical strategy for the management of sacral giant cell tumors: a 32 - case series [J]. *Spine J*, 2012, 12: 484 - 491.
- [5] Raskin KA, Schwab JH, Mankin HJ, et al. Giant cell tumor of bone[J]. *J Am Acad Orthop Surg*, 2013, 21: 118 - 126.
- [6] Honda H, Yoshida T, Shibue C, et al. Use of aortic occlusion balloon catheter for sacral giant cell tumor resection [J]. *Masui*, 2012, 61: 610 - 613.
- [7] He S, Li P, Chen CH, et al. Effective oncolytic vaccinia therapy for human sarcomas [J]. *J Surg Res*, 2012, 175: e53 - e60.
- [8] 陈文华, 王 祁, 何忠明, 等. 术前肿瘤动脉栓塞联合术中腹主动脉球囊阻断在骶骨肿瘤切除术中的应用[J]. 介入放射学杂志, 2012, 21: 212 - 215.
- [9] Gerbers JG, Jutte PC. Hip - sparing approach using computer navigation in periacetabular chondrosarcoma [J]. *Comput Aided Surg*, 2013, 18: 27 - 32.
- [10] Rudert M, Holzapfel BM, Pilge H, et al. Partial pelvic resection (internal hemipelvectomy) and endoprosthetic replacement in periacetabular tumors [J]. *Oper Orthop Traumatol*, 2012, 24: 196 - 214.
- [11] 徐国斌, 刘骏方, 熊 斌, 等. 腹主动脉球囊阻断在骶骨肿瘤手术治疗中的应用 [J]. 介入放射学杂志, 2008, 17: 787 - 789.

(收稿日期:2013-10-08)

(本文编辑:侯虹鲁)