

doi: 10.13241/j.cnki.pmb.2018.14.030

保乳手术与改良根治术治疗Ⅰ-Ⅱ期乳腺癌患者的疗效及生存状况 比较研究*

刘美宏¹ 毕洁领² 唐文¹ 马昌义¹ 郑轲¹

(1 宜宾市第二人民医院乳甲外科 四川 宜宾 644000; 2 宜宾市第二人民医院普外科 四川 宜宾 644000)

摘要 目的:比较分析乳腺癌保乳手术和根治术的临床疗效及患者生存状况。方法:回顾性分析2012年6月至2015年6月在我院乳腺外科行手术治疗的乳腺癌患者92例的临床资料,其中行保乳手术患者24例(保乳组),行根治手术患者68例(根治组),两组患者术后均采用个性化综合治疗巩固疗效,对比观察两组疗效及预后状况;通过乳腺癌生命质量测定量表(FACT-B)检测对比两组患者术后1、2年的生存质量;并对比两组患者术后乳房美容效果。结果:保乳组患者手术时间、术中出血量、引流量以及引流时间均明显较根治组少,差异有统计学意义($P<0.05$),而淋巴结清扫数则无明显差异($P>0.05$);两组患者上肢水肿发生率无明显差异($P>0.05$),而保乳组切缘皮瓣缺血发生率低于根治组($P<0.05$);两组患者术后2年生存率、复发率以及远处转移率无统计学差异($P>0.05$)。保乳组患者术后1、2年生理状况、情感状况、社会状况、功能状况、其他因素及生活质量综合评分均显著高于根治组,差异有统计学意义($P<0.05$);保乳组术后乳房美容效果的优良率显著高于根治组,差异有统计学意义($P<0.05$)。结论:相比于根治术,保乳手术不仅具有创伤小、术后恢复快的优势,患者预后状况与根治术相当,同时可更好的改善患者生存质量,术后乳房美容效果较好,临床应用价值更高。

关键词: 乳腺癌;保乳手术;根治术;疗效;生存质量

中图分类号:R737.9 文献标识码:A 文章编号:1673-6273(2018)14-2738-04

Comparative Study the Efficacy and Survival Status of Breast Conserving Surgery and Modified Radical Mastectomy in the Treatment of Stage I-II Breast Cancer*

LIU Mei-hong¹, BI Jie-ling², TANG Wen¹, MA Chang-yi¹, ZHENG Ke¹

(1 Department of Breast and Thyroid Surgery, The Second People's Hospital of Yibin, Yibin, Sichuan, 644000, China;

2 Department of General Surgery, The Second People's Hospital of Yibin, Yibin, Sichuan, 644000, China)

ABSTRACT Objective: To compare the clinical efficacy and survival status of patients with breast conserving surgery and radical mastectomy. **Methods:** The clinical data of 92 cases of patients with breast cancer who were treated with breast surgery from June 2012 to June 2015 in our hospital were analyzed retrospectively. Among them, 24 patients were underwent breast conserving surgery (breast conserving group), and 68 patients were underwent radical surgery (radical group). The efficacy and prognosis were compared between the two groups. The quality of life was compared between the two groups after 1 and 2 years by the breast cancer quality of life scale (FACT-B), and compared the cosmetic results of two groups after mastectomy. **Results:** The operation time, intraoperative blood loss, drainage volume and drainage time in the breast conserving group were significantly less than those in the radical group, the difference was statistically significant ($P<0.05$), but there was no obvious difference of lymph nodes ($P>0.05$). There was no significant difference in the incidence of upper limb edema between the two groups ($P>0.05$), while the incidence of flap ischemia in the breast conserving group was significantly lower than that in the radical group ($P<0.05$). There was no significant difference in postoperative 2 year survival rate, recurrence rate and distant metastasis rate between the two groups ($P>0.05$). The nutritional status, emotional status, social status, functional status, other factors and quality of life scores in the breast conserving group at 1 and 2 years after the operation were significantly higher than those in the radical group, the differences were statistically significant ($P<0.05$). The excellent and good rate of breast cosmetic effect in the breast conserving group was significantly higher than that in the radical group, the difference was statistically significant ($P<0.05$). **Conclusion:** Compared with the radical mastectomy, breast conserving surgery has the advantages of less trauma and quicker recovery, and the prognosis is similar to radical resection. At the same time, it can better improve the quality of life of patients, the cosmetic effect of breast surgery is better, and the clinical application value is higher.

Key words: Breast cancer; Breast conserving surgery; Radical mastectomy; Efficacy; Quality of life

Chinese Library Classification(CLC): R737.9 Document code: A

Article ID: 1673-6273(2018)14-2738-04

* 基金项目:四川省医学科研创新计划项目(Q15091)

作者简介:刘美宏(1979-),女,硕士,主治医师,从事乳腺甲状腺临床及相关方面的研究,E-mail:tweihuo@163.com

(收稿日期:2017-10-15 接受日期:2017-12-08)

前言

乳腺癌是常见的发生于乳腺腺上皮组织的女性恶性肿瘤之一,其99%的患者为女性^[1]。近年来,乳腺癌的发病率呈逐年递增的趋势,据相关研究报道,我国城市女性乳腺癌的发病率约为0.3%,对女性的身体健康和生活质量均造成严重影响^[2]。由于近年来女性乳腺癌的诊断水平的提高和相关防治知识的普及,乳腺癌的早期发现率得到了较大的提升,乳腺癌患者的术后复发率已达到50%左右,患者的5年生存率在60%左右^[3]。手术是乳腺癌治疗的重要手段之一,传统的根治术可取得令人满意的效果,但由于患者乳房缺失,严重影响了女性的形体美,使患者在承受病痛折磨的同时还需承受缺失乳房的打击,常出现焦虑、抑郁、恐慌等心理问题,严重影响患者生活质量,甚至影响婚姻及家庭^[4-6]。伴随着人们生活水平的不断提升及对外形美观要求的提高,根治术已经不能满足多数患者的需求,探究治疗乳腺癌的新手术方法势在必行^[7-8]。保乳手术是在保留乳房的基础上进行肿瘤切除,不仅能在一定程度减轻对患者乳房美观度的损害,也能有效降低手术对患者心理上的伤害,在临幊上取得一定疗效^[9,10]。本文旨在比较分析乳腺癌保乳手术和根治术的临床疗效及患者生存状况,现作如下报道。

1 资料和方法

1.1 临床资料

对2012年6月至2015年6月在我院乳腺外科行手术治疗的92例乳腺癌患者进行回顾性分析,纳入标准:(1)患者TNM分期为I期、II期;(2)肿瘤直径<3 cm,同时病灶和乳头距离>3 cm;(3)均为单发肿瘤或者是局限于1个象限内;(4)病灶未及乳晕;(5)患者及其家属对本研究知情同意。排除标准:(1)有手术禁忌症者;(2)伴有严重的心、肝、肾等疾病者;(3)存在严重的胸肌粘连者;(4)术前已行过放化疗或其他治疗者。其中行保乳手术患者24例(保乳组),年龄42~57岁,平均(49.32±4.81)岁;肿瘤直径0.4~2.8 cm,平均(1.41±0.82)cm;I期5例,II期19例。行根治手术患者68例(根治组),年龄44~58岁,平均(49.75±4.96)岁;肿瘤直径0.5~2.9 cm,平均(1.43±0.71)cm;I期18例,II期50例。两组患者基线资料无明显差异($P>0.05$),具有可比性。本研究符合我院伦理委员会的相关规定,并已批准通过。

1.2 方法

根治组患者采用乳腺癌改良根治术进行治疗,取梭形切口,在乳腺肿瘤的边缘再往外延伸3 cm进行切除,主要切除肿瘤、全部乳腺、乳头、皮肤,而胸大肌和胸小肌则不进行切除,腋

窝处淋巴结清扫至第2组。保乳组患者采用保乳手术进行治疗,术前先掌握患者肿块位置及大小,并以此为根据选择放射状或弧形切口,视患者乳房大小,在肿瘤边缘再往外延伸1~2 cm进行切除,直至胸肌筋膜,在切除肿瘤后,对内外上线四象限与基底部进行标记,在进行适当处理后送病理科进行检验,若肿瘤包块边缘组织检验后显示为阴性,再对腋窝和胸肌间等位置的淋巴结进行清扫。若病理结果提示切缘阳性,则需扩大切除,直至阴性为止。两组患者均在术后2周给予辅助化疗,根据患者的综合情况给予EC序贯T或TEC方案进行化疗。保乳组患者在术后12 d左右进行放疗,全乳照射剂量为45~50 Gy,如果患者存在腋窝淋巴结转移,则视情况对患侧锁骨上区和内乳区进行适当的放疗。根治组患者根据腋窝淋巴结转移数目≥4个、侵及胸肌膜以及切缘阳性决定是否行放疗。此外,雌激素受体(ER)阳性患者可给予他莫昔芬、来曲唑等内分泌治疗。

1.3 观察指标

(1)观察两组患者手术时间、术中出血量、引流量以及引流时间,统计两组术后发生上肢水肿、切缘皮瓣缺血等并发症发生率。(2)对两组患者以电话或上门回访的方式进行为期2年的随访,统计患者2年后局部复发率、远处转移率、以及生存率。(3)术后1、2年让患者根据自身情况填写乳腺癌生命质量测定量表^[11](Functional assessment of cancertherapy-breast,FACT-B),该量表通过生理状况、情感状况、社会状况、功能状况与其他因素等5个方面检测患者术后生存质量,分值越高,生存质量越佳。(4)对比两组患者术后乳房美容效果,差:两侧乳房水平差距>3 cm,明显不对称,外形及手感较差;良好:两侧乳房水平差距<3 cm,较对称,外形较正常,手感一般;优秀:两侧乳房水平差距<2 cm,对称性好,手感及外形与正常乳房无差异。

1.4 统计处理

采用SPSS16.0统计软件进行数据处理,手术指标、生存质量评分等计量资料用均数±标准差表示,组间采用t检验,并发症发生率、生存率、复发率、远处转移率等计数资料用率表示,采用 χ^2 检验,检验标准设置为 $\alpha=0.05$ 。

2 结果

2.1 两组手术相关指标比较

保乳组患者手术时间、术中出血量、引流量以及引流时间均明显较根治组少($P<0.05$),两组淋巴结清扫个数无统计学差异($P>0.05$)。见表1。

表1 两组患者手术相关指标比较(± s)

Table 1 Comparison of operative parameters between two groups(± s)

Groups	n	Operation time (min)	Intraoperative blood loss(mL)	Drainage volume (ml)	Drainage time(d)	Number of lymph node dissection (unit)
Radical group	68	145.21±14.32	218.85±30.63	358.97±68.21	14.32±3.15	13.53±2.82
Breast conserving group	24	105.15±10.82	142.76±24.94	147.14±48.51	5.84±2.37	12.42±2.34
t	-	12.487	10.945	13.993	12.025	1.728
P	-	0.000	0.000	0.000	0.000	0.087

2.2 两组术后并发症发生率比较

根治组和保乳组患者上肢水肿发生率分别为 7.35% (5/68)、8.33%(2/24), 两组比较无明显差异($P>0.05$), 而保乳组切缘皮瓣缺血发生率为 4.17%(1/24), 低于根治组的 22.06% (15/68), 差异有统计学意义($P<0.05$)。

2.3 两组预后比较

根治组和保乳组患者的术后 2 年生存率分别为 95.59%

(65/68)、95.83%(23/24), 复发率分别为 2.94%(2/68)、12.50% (3/24), 远处转移率分别为 5.88%(4/68)、8.33%(2/24), 两组间比较差异均无统计学意义($P>0.05$)。

2.4 两组术后 1、2 年生存质量比较

保乳组患者术后 1、2 年生理状况、情感状况、社会状况、功能状况、其他因素及生活质量综合评分均显著高于根治组($P<0.05$), 见表 2。

表 2 两组术后 1、2 年生存质量比较($\bar{x}\pm s$, 分)

Table 2 Comparison of quality of life in the two groups after 1 and 2 years($\bar{x}\pm s$, scores)

Groups	n	Time	Physiological condition	Emotional status	Social conditions	Functional status	Other factors	Total quality of life
Radical group	68	1 years after operation	14.56± 1.21	12.29± 1.51	16.22± 1.65	14.41± 1.36	15.18± 1.39	72.66± 2.35
		2 years after operation	14.61± 1.23	14.43± 1.46	17.55± 1.30	12.85± 1.66	17.22± 1.52	76.66± 6.41
Breast conserving group	24	1 years after operation	17.53± 1.08*	15.55± 1.21*	18.55± 1.58*	17.21± 1.52*	18.21± 1.86*	87.05± 2.86*
		2 years after operation	19.52± 1.93*	17.72± 1.46*	19.86± 2.33*	18.88± 1.66*	22.15± 2.13*	98.13± 4.86*

Note: compared with the radical group at the same time, * $P<0.05$.

2.5 两组患者术后乳房美容效果比较

保乳组术后乳房美容效果的优良率显著高于根治组 ($P<$

0.05), 见表 3。

表 3 两组患者术后乳房美容效果比较[n(%)]

Table 3 Comparison of breast cosmetic results of two groups [n(%)]

Groups	n	Poor	Good	Excellent	Excellent and good rate
Radical group	68	68(100.00)	0(0.00)	0(0.00)	0(0.00)
Breast conserving group	24	1(4.17)	3(12.50)	20(83.33)	23(95.83)
χ^2					86.889
P					0.000

3 讨论

乳腺癌是女性高发的恶性肿瘤之一, 随着医疗水平的不断发展, 临床治疗乳腺癌的方法也越来越多, 如手术及放化疗治疗, 另外内分泌以及靶向治疗也逐渐在乳腺癌的治疗中得到应用, 然而对于处在 I 期、II 期乳腺癌患者, 手术治疗仍然是首选方案^[12,13]。早在十九世纪末, 临幊上便开始采用根治术来治疗乳腺癌, 根治术的理论基础在于 I 期、II 期的乳腺癌为局部浸润, 其主要转移途径是淋巴道, 血行转移的情况只在肿瘤晚期出现, 而最近的研究结果显示, 在 I 期、II 期的乳腺癌患者中其实已经存在血行转移的情况, 且淋巴转移途径也并非只存在于早期, 因此局部治疗并不会对疗效产生较大影响^[14-16]。相关研究也证实了保乳术和根治术之间在生存率、复发率以及转移率方面无明显差异, 患者生存率并不和切除范围呈正比^[17]。因此近年来, 乳腺癌手术朝着“小范围”切除的方向发展。故目前行保乳手术治疗的乳腺癌患者比例也在不断上升, 有报道称, 美国保乳手术比例为 50%, 而在日本也超过了 30%^[18]。主要原因是保乳手术不仅在保证了疗效的同时, 也最大限度保留了乳腺组织, 在形体上满足了女性患者对美的需求^[19,20]。

在本研究中, 保乳组患者在手术时间、术中出血量、引流量以及引流时间四项指标中均明显优于根治组($P<0.05$), 而在淋巴结清扫个数方面无明显差异($P>0.05$)。这与周强^[21]等人研

究结果类似。研究结果表明了实施保乳手术尽管切除范围不及根治术, 但并不会对淋巴结的清扫造成障碍, 同时大幅缩短了手术时间和引流时间, 也减少了术中出血量以及引流量, 提示临床保乳手术在减轻患者痛苦和手术医师工作量上作用明显。值得注意的是, 乳腺癌患者术后有一定几率发生切口感染、皮下积液、上肢水肿以及切缘皮瓣缺血等并发症^[22]。在本研究中主要为上肢水肿、切缘皮瓣缺血两种, 研究结果表明保乳组和根治组患者在上肢水肿发生率无明显差异($P>0.05$), 而保乳组切缘皮瓣缺血发生率则显著低于根治组($P<0.05$)。发生上肢水肿的原因主要是由腋窝淋巴结清扫过大、术后放疗诱发静脉炎以及淋巴管壁增厚闭塞导致, 大部分患者能够自行缓解, 也可采用针灸、中药等方法缓解症状^[23,24]。皮瓣缺血是由于皮瓣缝合张力过大导致的, 通常是切口中段张力最大处容易发生^[25]。分析原因, 猜测是两组患者均进行了淋巴结大范围清扫, 同时手术过程中可能伤及淋巴管, 致使淋巴管增厚, 导致术后水肿发生, 故两组水肿发生率无明显差异^[26,27]。而由于根治组患者切除范围大, 因此缝合张力要明显高于保乳组, 因此皮瓣缺血发生率要明显高于保乳组, 该结果和朱弘艳^[28]在文献中报道相近。病灶切除范围多大才能有效减少复发率、转移率一直以来都是乳腺外医师最为关注的重点之一。研究表明, 术后复发以及转移的高危因素是肿瘤边缘 2 cm 内, 因此有学者表示, 推荐保乳手术的切除范围为瘤旁 2 cm 处, 同时术后再辅以放化

疗、内分泌等治疗能够有效降低复发率及转移率。进一步研究发现,两组患者在术后生存率、复发率以及远处转移率无明显差异($P>0.05$)。这也说明了保乳手术与根治手术相比,不仅保证了相近的生存率、复发率以及远处转移率,同时手术创伤更小,形体美观更受患者的青睐,可有效提高年轻女性的生活质量。有研究显示^[29],术后不予以放化疗等辅助治疗,其5年局部复发率为40%,因此为了有效降低复发率,术后辅助治疗环节必不可少。相关研究报道^[30],患者在接受改良根治术后病情多有缓解,但由于改良根治术对于患者的形体美损伤较大,乳房的缺失会导致患者出现焦虑、抑郁、恐慌、自卑等不良情绪,降低生活质量。本次研究结果显示,保乳组患者术后1、2年生理状况、情感状况、社会状况、功能状况、其他因素及生活质量综合评分均显著高于根治组,保乳组术后乳房美容效果的优良率显著高于根治组($P<0.05$),说明保乳术能充分保留患侧皮肤,保障患者乳房美观度,有效满足患者对形体的要求,减轻手术对患者形体及心理上的伤害,提高患者生活质量。

综上所述,对于I期、II期乳腺癌,同时有强烈的美观要求的患者,可选则保乳手术进行治疗,其具有创伤小、术后恢复时间短的特点,且对乳房外形的改变不大,能满足患者的美观要求,改善患者生存质量,与改良根治术相比临床应用价值更高。

参 考 文 献(References)

- [1] Zhang W, Wang MY, Wei XL, et al. Associations of Epstein-Barr Virus DNA in PBMCs and the Subtypes with Breast Cancer Risk[J]. *J Cancer*, 2017, 8(15): 2944-2949
- [2] 张军,张永庆,王昌亮,等.35岁以下年轻乳腺癌患者的临床特征及预后因素分析[J].现代生物医学进展,2016,16(12): 2346-2350
Zhang Jun, Zhang Yong-qing, Wang Chang-liang, et al. Clinical Characteristics and Prognostic Factors of Breast Carcinoma in Women Aged 35 Years or Younger [J]. *Progress in Modern Biomedicine*, 2016, 16(12): 2346-2350
- [3] Lian W, Fu F, Lin Y, et al. The Impact of Young Age for Prognosis by Subtype in Women with Early Breast Cancer [J]. *Sci Rep*, 2017, 7(1): 11625
- [4] Kuerer HM, Smith BD, Chavez-MacGregor M, et al. DCIS Margins and Breast Conservation: MD Anderson Cancer Center Multidisciplinary Practice Guidelines and Outcomes [J]. *J Cancer*, 2017, 8(14): 2653-2662
- [5] Cohen O, Lam G, Karp N, et al. Determining the Oncologic Safety of Autologous Fat Grafting as a Reconstructive Modality: An Institutional Review of Breast Cancer Recurrence Rates and Surgical Outcomes[J]. *Plast Reconstr Surg*, 2017, 140(3): 382e-392e
- [6] Li N, Zheng Z, Li J, et al. Immediate breast reconstruction with omental flap for luminal breast cancer patients: Ten clinical case reports[J]. *Medicine (Baltimore)*, 2017, 96(33): e7797
- [7] Enomoto M, Yagishita K, Okuma K, et al. Hyperbaric oxygen therapy for a refractory skin ulcer after radical mastectomy and radiation therapy: a case report[J]. *J Med Case Rep*, 2017, 11(1): 5
- [8] Buonomo OC, Caredda E, Portarena I, et al. New insights into the metastatic behavior after breast cancer surgery, according to well-established clinicopathological variables and molecular subtypes [J]. *PLoS One*, 2017, 12(9): e0184680
- [9] Escribà JM, Esteban L, Gálvez J, et al. Reoperations after primary breast conserving surgery in women with invasive breast cancer in Catalonia, Spain: a retrospective study[J]. *Clin Transl Oncol*, 2017, 19(4): 448-456
- [10] He XM, Zou DH. The association of young age with local recurrence in women with early-stage breast cancer after breast-conserving therapy: a meta-analysis[J]. *Sci Rep*, 2017, 7(1): 11058
- [11] 庄鑫,赵维瑜.乳腺癌患者心理健康状况以及社会支持对其康复的影响[J].四川医学,2013,34(3): 472-474
Zhuang Xin, Zhao Wei-yu. Breast cancer patients psychological health and social support on its recovery[J]. *Sichuan Medical Journal*, 2013, 34(3): 472-474
- [12] Stoleru LS, Stoleru S. Radiation Therapy Following Breast Conserving Surgery for Ductal Carcinoma in situ: Yes or No? [J]. *Chirurgia (Bucur)*, 2017, 112(4): 403-412
- [13] Roy PG, Tenovici AA. Staged approach to partial breast reconstruction to avoid mastectomy in women with breast cancer [J]. *Gland Surg*, 2017, 6(4): 336-342
- [14] Tsoucalas G, Vladimiro L, Sgantzios M. Greek Surgeon Pavlos Ioannou's Possible Influence on William Halsted's Famous Radical Mastectomy[J]. *Surg Innov*, 2017, 24(5): 530-532
- [15] Dannenfelser R, Nome M, Tahiri A, et al. Data-driven analysis of immune infiltrate in a large cohort of breast cancer and its association with disease progression, ER activity, and genomic complexity [J]. *Oncotarget*, 2017, 8(34): 57121-57133
- [16] Liede A, Jerzak KJ, Hernandez RK, et al. The incidence of bone metastasis after early-stage breast cancer in Canada[J]. *Breast Cancer Res Treat*, 2016, 156(3): 587-595
- [17] 黄湛,杨传盛,张诠,等.保留乳头乳晕复合体的改良根治术对早期乳腺癌的疗效研究[J].实用癌症杂志,2013,28(3): 256-259
Huang Zhan, Yang Chuan-sheng, Zhang Quan, et al. The Clinical Study of Modified Radical Operation of Preserving Nipple-areolar Complex for Early Stage Breast Cancer [J]. *The Practical Journal of Cancer*, 2013, 28(3): 256-259
- [18] Van Deurzen CH. Predictors of Surgical Margin Following Breast-Conserving Surgery: A Large Population-Based Cohort Study [J]. *Ann Surg Oncol*, 2016, 23(Suppl 5): 627-633
- [19] Lim G, Pineda LA. Applicability of Oncoplastic Breast Conserving Surgery in Asian Breast Cancer Patients [J]. *Asian Pac J Cancer Prev*, 2016, 17(7): 3325-3328
- [20] McClain JT, Buice WS. AnMed Health Compliance Study--Adjuvant Radiation Therapy Following Breast Conserving Surgery [J]. *J S C Med Assoc*, 2015, 111(2): 64-65
- [21] 周强.保乳术与改良根治术在早期乳腺癌治疗中的效果比较[J].中国医药导报,2015,12(32): 100-103
Zhou Qiang. Comparison on effect of breast conserving surgery and modified radical operation in treatment of early breast cancer[J]. *China Medical Herald*, 2015, 12(32): 100-103
- [22] Li L, Yuan L, Chen X, et al. Current Treatments for Breast Cancer-Related Lymphoedema: A Systematic Review [J]. *Asian Pac J Cancer Prev*, 2016, 17(11): 4875-4883
- [23] 王连东,亓军,孔亮,等.乳腺癌改良根治手术并发症原因分析及预防对策[J].河北医学,2013,19(10): 1495-1498 (下转第 2787 页)

- Toxicol, 2010, 23(2): 373-378
- [14] Miller AC, Rivas R, Tesoro L, et al. Radiation exposure from depleted uranium: The radiation bystander effect [J]. Toxicol Appl Pharm, 2017, 331: 135-141
- [15] Song Y, Salbu B, Teien H, et al. Hepatic transcriptional responses in Atlantic salmon (*Salmo salar*) exposed to gamma radiation and depleted uranium singly and in combination [J]. Sci Total Environ, 2016, 562: 270-279
- [16] Garmash SA, Smirnova VS, Karp OE, et al. Pro-oxidative, genotoxic and cytotoxic properties of uranyl ions [J]. J Environ Radioact, 2014, 127: 163-170
- [17] Hao Y, Liu C, Huang J, et al. Ghrelin protects against depleted uranium-induced apoptosis of MC3T3-E1 cells through oxidative stress-mediated p38-mitogen-activated protein kinase pathway [J]. Toxicol Appl Pharmacol, 2016, 290: 116-125
- [18] Zheng J, Zhao T, Yuan Y, et al. Hydrogen sulfide (H₂S) attenuates uranium-induced acute nephrotoxicity through oxidative stress and inflammatory response via Nrf2-NF-κB pathways [J]. Chem-Biol Interact, 2015, 242: 353-362
- [19] Nordberg GF, Fowler BA, Nordberg M. Handbook on the Toxicology of Metals[M]. London: Elsevier, 2015: 1307-1345
- [20] 刘玉龙,李明华,孙晓亮,等.贫铀的毒性及解毒促排药物研究进展 [J].解放军药学学报, 2014, (05): 454-458
Liu Yu-long, Li Ming-hua, Sun Xiao-liang, et al. Hazards of internal contamination of depleted uranium and progress in uranium chelating and detoxicating agents research [J]. Pharmaceutical Journal of Chinese People's Liberation Army, 2014, (05): 454-458
- [21] Kitahara K, Numako C, Terada Y, et al. Uranium XAFS analysis of kidney from rats exposed to uranium [J]. J Synchrotron Radiat, 2017, 24(Pt2): 456-462
- [22] Jim V, LaViolette C, Briehl MM, et al. Spatial distribution of uranium in mice kidneys detected by laser ablation inductively coupled plasma mass spectrometry[J]. J Appl Bioanal, 2017, 3(3): 43-48
- [23] Bourgeois D, Burt-Pichat B, Le Goff X, et al. Micro-distribution of uranium in bone after contamination: new insight into its mechanism of accumulation into bone tissue [J]. Anal Bioanal Chem, 2015, 407 (22): 6619-6625
- [24] Arzuaga X, Gehlhaus M, Strong J. Modes of action associated with uranium induced adverse effects in bone function and development [J]. Toxicol Lett, 2015, 236(2): 123-130
- [25] Dinocourt C, Legrand M, Dublineau I, et al. The neurotoxicology of uranium[J]. Toxicology, 2015, 337: 58-71
- [26] Lemercier V, Millot X, Ansoborlo E, et al. Study of uranium transfer across the blood-brain barrier [J]. Radiat Prot Dosimetry, 2003, 105 (1-4): 243-245
- [27] Ibanez C, Suhard D, Tessier C, et al. Intranasal exposure to uranium results in direct transfer to the brain along olfactory nerve bundles[J]. Neuropathol Appl Neuro, 2014, 40(4): 477-488
- [28] Dublineau I, Souidi M, Gueguen Y, et al. Unexpected lack of deleterious effects of uranium on physiological systems following a chronic oral intake in adult rat[J]. BioMed Res Int, 2014, 2014: 1-24
- [29] Mcdiarmid MA, Gaitens JM, Hines S, et al. Biologic monitoring and surveillance results for the department of veterans affairs' depleted uranium cohort: Lessons learned from sustained exposure over two decades[J]. Am J Ind Med, 2015, 58(6): 583-594
- [30] Fister S, Jovic S. The frequency of chromosomal aberrations in sheep from the area contaminated by depleted uranium during NATO air strikes in 1999[J]. Nucl Technol Radiat, 2014, 29(1): 88-95
- [31] Fathi RA, Matti LY, Al-Salih HS, et al. Environmental pollution by depleted uranium in Iraq with special reference to Mosul and possible effects on cancer and birth defect rates [J]. Med Confl Surviv, 2013, 29(1): 7-25
- [32] Al-Hashimi MM, Wang XJ. Breast cancer in Iraq, incidence trends from 2000-2009[J]. Asian Pac J Cancer Prev, 2014, 15(1): 281-286

(上接第 2741 页)

- Wang Lian-dong, Qi Jun, Kong Liang, et al. Reason Analysis and Preventive Measures on Complications of Breast Cancer Operation [J]. Hebei Medicine, 2013, 19(10): 1495-1498
- [24] Zhu H, Peng Z, Dai M, et al. Efficacy and safety of Wuling San for treatment of breast-cancer-related upper extremity lymphoedema: study protocol for a pilot trial[J]. BMJ Open, 2016, 6(12): e012515
- [25] Rauer T, Sproedt J, Gelpke H, et al. Acute colonic pseudo-obstruction (Ogilvie's syndrome) - a rare complication after ablation mammae and direct reconstruction with a free TRAM flap [J]. Handchir Mikrochir Plast Chir, 2014, 46(4): 263-265
- [26] Chirappapha P, Somintara O, Lertsithichai P, et al. Complications and oncologic outcomes of pedicled transverse rectus abdominis myocutaneous flap in breast cancer patients [J]. Gland Surg, 2016, 5(4): 405-415
- [27] Kim M, Shin KH, Jung SY, et al. Identification of Prognostic Risk Factors for Transient and Persistent Lymphedema after Multimodal Treatment for Breast Cancer [J]. Cancer Res Treat, 2016, 48 (4): 1330-1337
- [28] 朱弘艳.乳腺癌术后并发症的预防及处理[J].安徽医药, 2013, 17 (1): 107-108
Zhu Hong-yan. Prevention and management of postoperative complications of breast cancer[J]. Anhui Medical and Pharmaceutical Journal, 2013, 17(1): 107-108
- [29] Jinno T, Kurumiya Y, Niwa T, et al. Two Cases of ER-Positive Postmenopausal Breast Cancer That Increased in Size during Neoadjuvant Hormone Therapy [J]. Gan To Kagaku Ryoho, 2016, 43 (13): 2539-2542
- [30] Sharma N, Purkayastha A. Postmastectomy Pain: A Cross-sectional Study of Prevalence, Pain Characteristics, and Effects on Quality of Life[J]. J Midlife Health, 2017, 8(2): 75-83