doi: 10.13241/j.cnki.pmb.2018.22.036

前哨淋巴结活检术联合保乳治疗对早期乳腺癌患者临床疗效、术后并发症及肩关节功能的影响*

罗 迤[1] 陈 静[2] 张 淇[1] 侯泽宇[1] 程晓明[1△]

(1 遵义医学院附属医院甲乳外科 贵州 遵义 563000;2 遵义医学院附属医院体检中心 贵州 遵义 563000)

摘要 目的:探讨前哨淋巴结活检术联合保乳治疗对早期乳腺癌患者临床疗效、术后并发症及肩关节功能的影响。**方法:**选取2014年10月至2017年2月就诊于我院的乳腺癌患者,按照患者手术方式分为联合组与对照组,其中联合组行前哨淋巴结活检手术联合保乳治疗,对照组行传统腋窝淋巴结清扫术治疗,每组各选取50例,随访时间为6个月。比较两组手术情况、并发症、乳腺美容效果及肩关节功能情况。**结果:**联合组手术时间、总出血量、引流管拔除时间、总引流量均明显低于对照组(*P<0.05*)。手术治疗后,联合组并发症比例为6%,明显低于对照组38%。术后,两组患者随访6个月,联合组乳腺美容效果明显高于对照组(*P<0.05*)。术前,两组肩关节功能各指标水平比较差异不显著(*P>0.05*);术后,两组肩关节屈曲活动度、外旋活动度、后伸活动度、外展活动度相较于术前均明显降低(*P<0.05*),联合组内旋活动度相较于术前降低不显著(*P>0.05*),而对照组内旋活动度相较于术前降低显著(*P<0.05*)。术后,联合组肩关节屈曲活动度、外旋活动度、内旋活动度、后伸活动度、外展活动度均显著高于对照组(*P<0.05*)。**结论:**前哨淋巴结活检术联合保乳治疗早期乳腺癌创伤小,美容效果明显,可显著降低术后并发症发生率并减轻对患者肩关节功能的损害,远期疗效仍有待于进一步随访观察。

关键词:前哨淋巴结活检;保乳;早期乳腺癌;疗效;并发症;肩关节功能

中图分类号:R737.9 **文献标识码:**A **文章编号:**1673-6273(2018)22-4357-05

Effect of Sentinel Lymph Node Biopsy Combined with Breast-conserving Therapy on the Clinical Efficacy, Postoperative Complications and Shoulder Function of Patients with Early Breast Cancer*

LUO Yi[1], CHEN Jing[2], ZHANG Qi[1], HOU Ze-yu[1], CHENG Xiao-ming[1△]

(1 Department of Thyroid and breast surgery , Zunyi, Guizhou, 563000, China;

2 Medical center, Affiliated Hospital of Zunyi Medical College, Zunyi, Guizhou, 563000, China)

ABSTRACT Objective: To investigate the effect of sentinel lymph node biopsy combined with breast-conserving therapy on the clinical efficacy, postoperative complications and shoulder function of patients with early breast cancer. **Methods:** Patients with breast cancer treated in our hospital from October 2014 to February 2017 were divided into the combined group and control group according to the patients' operation, 50 cases were selected in each group. The combined group received sentinel lymph node biopsy combined with breast-conserving therapy. The control group was treated with traditional axillary lymph node dissection. The follow-up period was 6 months. The operation condition, complications, cosmetic results and shoulder function were compared between the two groups. **Results:** The total operative time, total bleeding volume, drainage time and total drainage volume of the combined group were significantly lower than those of the control group (*P<0.05*). After surgery, the complication rate was 6% in the combined group, significantly lower than that in the control group (38%). Two groups were followed up for 6 months, the breast cosmetic effect of combined group was significantly higher than the control group (*P<0.05*). Before surgery, there were no significant differences in the indexes of shoulder joint function between the two groups (*P>0.05*). After surgery, the flexion activity, external rotation activity, extension activity and abduction activity of the two groups were significantly higher than those before operation (*P<0.05*). The internal rotation activity of the combined group was not significantly changed (*P>0.05*), while the internal rotation activity of the control group was significantly lower than that before the operation (*P<0.05*). After operation, the flexion activity, external rotation activity, internal rotation activity, posterior extension activity and abduction activity of the combined group were significantly higher than those of the control group (*P<0.05*). **Conclusion:** Sentinel lymph node biopsy combined with breast-conserving treatment of early breast cancer is less traumatic, obviously effective in cosmetic, and can significantly reduce the incidence of postoperative complications and the shoulder joint function damage. The long-term effect remains to be further observed.

* 基金项目:贵州省遵义市汇川区科学技术局项目(209.001.107.03)

作者简介:罗迤(1986-),硕士,主要从事乳腺肿瘤学方面的研究,电话:13765278883,E-mail: luoyi574@163.com

△ 通讯作者:程晓明,本科,主任医师,主要从事乳腺肿瘤学方面的研究

(收稿日期:2018-04-07 接受日期:2018-04-29)

Key words: Sentinel lymph node biopsy; Breast conserving; Early breast cancer; Efficacy; Complications; Shoulder function
Chinese Library Classificaiton(CLC): R737.9 Document code: A
Article ID:1673-6273(2018)22-4357-05

前言

乳腺癌是女性高发恶性肿瘤,临床症状主要表现为乳头回缩、乳头溢液以及乳房皮肤橘皮样改变等,传统治疗方法主要为乳房切除配合腋窝淋巴结清扫术治疗,而该方法手术时间长、创伤大、并发症多,且术后易造成患者肩部功能障碍,对术后生活及身心健康造成极大影响[1,2]。近年来,保留乳房的乳腺癌切除术在临床上广泛应用,该综合疗法可避免乳房缺失且具有类似于传统手术的减少复发的疗效,可显著提高患者术后的生活质量,具有积极的临床价值[3-6]。国内外许多研究已经证实保乳保腋窝手术的安全性[7,8]。前哨淋巴结活检术联合保乳治疗乳腺癌患者,具有手中时间短、术后创伤小及恢复快,并发症较少,美容效果好等优点[9-11]。本研究主要探讨了前哨淋巴结活检术与保乳联合应用治疗早期乳腺癌患者的手术疗效及对患者肩功能的影响,结果报道如下。

1 资料与方法

1.1 一般资料

选取 2014 年 10 月至 2017 年 2 月期间就诊于我院的早期乳腺癌患者作回顾性分析,按照患者手术方式分为联合组与对照组,其中行前哨淋巴结活检术联合保乳治疗患者设为联合组,选取 50 例,行腋窝淋巴结清扫术患者设为对照组,选取 50 例。随访时间为 6 个月。联合组年龄 29 岁 ~68 岁,平均年龄(43.8± 4.7)岁;其中病位外上象限 35 例,非外上象限 15 例;浸润性导管癌 27 例,非浸润性导管癌 23 例;临床分期Ⅰ期 21 例,Ⅱ期 29 例。对照组年龄 31 岁 ~69 岁,平均年龄(45.1± 4.2)岁;其中病位外上象限 32 例,非外上象限 18 例;浸润性导管癌 29 例,非浸润性导管癌 21 例;临床分期Ⅰ期 19 例,Ⅱ期 31 例。联合组与对照组基线资料比较无统计学差异(*P>0.05*)。

病例纳入标准:按照乳腺癌诊断标准[12]确诊为早期乳腺癌且临床分期为Ⅰ、Ⅱ期;乳腺肿瘤与乳头距离在 3 cm 以上且肿块在 5 cm 之内;患者及家属知情同意本研究并签订同意书。病例排除标准:非原发性乳腺癌;有局部复发或远处转移症状;伴有严重肝肾功能不全;患有精神疾病。

1.2 治疗方法

两组患者均行气管插管全身麻醉,采取仰卧位,将患侧肩关节适当外展。在乳房肿瘤边缘约 3 cm 处作横梭形、纵梭形切口,切口大小根据乳房形状、大小以及肿瘤的位置决定。

联合组采用前哨淋巴结活检术联合保乳治疗方式。前哨淋巴结活检术:麻醉成功后注射 1%亚甲蓝 2-4 mL 至乳腺肿瘤边缘,注射后局部按压 15 min 左右以促进吸收;以切口 5 cm 在腋毛区下缘切开皮肤及皮下组织,腋窝方向潜行分离皮瓣,沿胸大肌外平行肌束寻找被染蓝的淋巴管,并沿着淋巴管由下至上、由内向外逐步向腋窝部寻找被染蓝的淋巴结,即为前哨淋巴结。将前哨淋巴结切除送快速病理检查,若结果为阴性则逐层缝合切口,若为阳性则改行腋窝淋巴结清扫术。保乳治疗:切口手术完成后,距肿瘤边缘 2 cm 左右将肿瘤完整切除,并标记上、下、左、右、基底切缘送快速病理检查,如果检查结果为阴性则用美容线将切口逐层缝合,如果为阳性则需扩大切除范围并再次送检,若该结果仍为阳性,则患者改行腋窝淋巴结清扫术。

对照组实施腋窝淋巴结清扫术。切口手术完成后,皮肤切除范围距离肿瘤约 3 cm,皮下潜行,手术范围从锁骨至腹直肌上段,外部由背阔肌前缘起、至内部胸骨旁,清除范围内乳腺腺体、脂肪淋巴组织,胸大小肌根据患者情况切除或保留。

1.3 观察指标

观察记录两组患者手术时间、总出血量、引流管拔除时间、总引流量并进行比较。对两组患者术后并发症情况包括上肢水肿、皮瓣坏死、皮下积液、并发症比例等作记录并进行比较。根据美国放射治疗联合中心 (Joint Center For Radiation Therapy, JCRT)标准对患者术后乳腺美容效果进行评估[13]:① 优:两边乳房对称,乳头水平差距在 2 cm 之内,两侧乳房外形无差异且乳房皮肤正常;② 良:两边乳房对称,乳头水平差距在 3 cm 之内,两侧乳房外形基本正常,乳房皮肤颜色浅亮;③ 差:两边乳房不对称,乳头水平差距在 3 cm 之上,乳房外形明显缩小且皮肤粗糙。根据肩关节功能评分系统评价方法[14]对患者术前和术后肩关节屈曲、外旋、内旋、后伸、外展功能的活动度进行测量评估。

1.4 统计学处理

本研究统计所得结果数据均采用 SPSS19.0 统计学软件进行处理分析,其中计数资料以(n,%)表示,采用 x^2 检验。手术时间、总出血量、引流管拔除时间、总引流量等手术情况指标以及肩关节屈曲、外旋、内旋、后伸、外展活动度等肩功能指标水平均服从正态分布,以($\bar{x}\pm s$)表示,采用 t 检验。以 *P<0.05* 表示差异有统计学意义。

2 结果

2.1 两组手术指标的比较

两组手术均完成顺利,联合组手术时间为 (58.44± 10.32) min,总出血量为(61.61± 0.58)mL,引流管拔除时间为(5.18± 1.47)d,总引流量为(100.35± 20.75)mL,均明显低于对照组(*P< 0.05*),见表 1。

表 1 两组手术情况比较(n=50, $\bar{x}\pm s$)

Table 1 Comparison of the operation situation between two groups(n=50, $\bar{x}\pm s$)

Groups	Operation time (min)	Total amount of bleeding (mL)	Extraction time of drainage tube (d)	Total flow rate (mL)
Joint group	58.44± 10.32#	61.61± 0.58#	5.18± 1.47#	100.35± 20.75#
Control group	125.34± 32.78	121.27± 0.62	30.25± 10.72	260.87± 14.22

Note: compared with the control group, #*P<0.05*.

2.2 两组术后并发症发生情况的比较

手术治疗后，联合组上肢水肿 1 例、无皮瓣坏死、皮下积液 2 例，并发症比例为 6%；对照组上肢水肿 11 例、皮瓣坏死 2 例、皮下积液 6 例，并发症比例为 38%；联合组并发症比例明显低于对照组，差异有统计学意义（*P<0.05*）。见表 2。

表 2 两组术后并发症的发生情况比较(n=50, %)

Table 2 Comparison of the incidence of postoperative complications between two groups (n=50, %)

Groups	Upper limb edema	Necrosis of skin flap	subcutaneous hydrops	Proportion of complications
Joint group	1	0	2	6.0/3#
Control group	11	2	6	38.0/19

Note: compared with the control group, #*P<0.05*.

2.3 两组术后半年乳腺美容效果比较

手术治疗后，两组患者均随访 6 个月。乳腺美容效果联合组优 32 例，良 18 例，无美容效果差患者，优良率为 100%。对照组优良率 74%，明显低于联合组（*P<0.05*）。见表 3。

表 3 两组术后乳腺美容效果的比较(n=50, %)

Table 3 Comparison of the postoperative breast cosmetology between two groups (n=50, %)

Groups	Excellent	effective	Invalid	Superior rate
Joint group	32	18	0	50/100.0#
Control group	21	16	13	37/74.0

Note: compared with the control group, #*P<0.05*.

2.4 两组术前术后肩关节功能的比较

术前，两组肩关节功能各指标水平比较差异不显著（*P>0.05*）。手术治疗后，两组肩关节屈曲活动度、外旋活动度、后伸活动度、外展活动度相较于术前均明显降低（*P<0.05*）；联合组内旋活动度相较于术前降低不显著（*P>0.05*），而对照组内旋活动度相较于术前降低显著（*P<0.05*）。术后，联合组肩关节屈曲活动度、外旋活动度、内旋活动度、后伸活动度、外展活动度均显著高于对照组（*P<0.05*）。见表 4。

表 4 两组术前和术后肩关节功能水平的比较(n=50, $\bar{x}\pm s$)

Table 4 Comparison of the shoulder joint function between two groups before and after operation(n=50, $\bar{x}\pm s$)

Groups	Time	buckling mobility (°)	External rotation(°)	Internal rotation(°)	Extension activity(°)	Abduction activity(°)
Joint group	Before opreation	169.89± 9.31	86.81± 5.83	86.75± 4.92	67.01± 5.83	172.75± 8.92
	After operation	151.91± 8.53*#	70.14± 4.11*#	84.94± 3.61#	56.84± 4.11*#	138.54± 7.61*#
Control group	Before opreation	172.84± 9.04	87.31± 4.92	87.32± 5.02	66.31± 5.22	174.32± 9.02
	After operation	133.92± 8.44*	52.64± 3.84*	80.02± 3.84*	47.64± 3.92*	109.08± 7.84*

Note: compared with the preoperative, **P<0.05*, compared with the control group, #*P<0.05*.

3 讨论

乳腺癌治疗方法以乳腺切除手术为主，需切除整个乳房并结合腋窝淋巴结常规清扫，虽可彻底清除肿瘤，有效控制肿瘤扩散，但全乳切除也对患者身心造成了巨大伤害，且会出现皮瓣组织坏死等并发症及肩关节功能损害[15,16]。随着乳腺癌筛查水平的提高，早期确诊病例逐渐增多，为早期乳腺癌患者的手术治疗提供了有利条件[17]。国内外研究[18-22]表明早期乳腺癌患者应用保乳手术治疗，患者远期生存率以及局部和区域的肿瘤控制率与传统乳腺全切手术较接近，而且能在最大程度上保留患者的乳房形态，且有术后恢复快、并发症较少等优势，可显著提高患者乳房美容效果满意度及生活质量。腋窝淋巴结清扫术因手术创伤大，术中可能导致患者肩胛骨、肩关节相关神经、肌肉、血管暴露或切除，患者术后易出现上肢功能障碍、皮下积液等并发症，影响疗效及预后[23-25]。而针对腋窝淋巴结阴性患者所实施的前哨淋巴结清扫术则在极大程度上缩小了手术范围，可有效避免腋窝淋巴结清扫所造成的并发症，保留乳房[26-30]。

本研究结果显示联合组手术时间、总出血量、引流管拔除时间、总引流量、并发症发生率均明显低于对照组，表明前哨淋巴结活检术联合保乳手术相较于传统腋窝淋巴结清扫术手术创伤更小且安全性更高，原因可能是术前前哨淋巴结活检定位准确，可对腋窝淋巴结的转移情况进行准确预测，从而可以尽早检测出癌细胞的转移并控制癌细胞蔓延。同时，联合保乳手术对患者创伤相对较小，应激影响较小，可有效缩短手术时间，因此有助于降低术中出血量、缩短拔管时间，对患者术后恢复起到良好的促进作用。本研究中，联合组术后乳腺美容效果明显高于对照组，表明前哨淋巴结活检术联合保乳手术对患者术后乳房美观效果有更好的保持作用。

本研究中，联合组术后肩关节屈曲活动度、外旋活动度、内旋活动度、后伸活动度、外展活动度均显著高于对照组，表明两

组手术均对患者肩关节功能造成不良影响，但是前哨淋巴结活检术联合保乳治疗对患者影响相较于腋窝淋巴结清扫明显降低。可能是因为前哨淋巴结活检术避免了腋窝淋巴结阴性患者进行不必要的腋窝淋巴结清扫，因而避免传统腋窝淋巴结清扫术带来的肩部功能障碍。

综上所述，前哨淋巴结活检术联合保乳治疗早期乳腺癌创伤小，美容效果明显，可显著降低术后并发症发生率并减轻对患者肩关节功能的损害，但远期疗效仍有待于进一步随访观察。

参 考 文 献(References)

[1] 李刚, 李峻, 罗方鑫, 等. 乳腺癌保乳术后局部复发影响因素分析[J]. 海南医学院学报, 2013, 19(11): 1576-1578
Li Gang, Li Jun, Luo Fang-xin, et al. Influence factors of recurrence of breast cancer after conservative surgery [J]. Journal of Hainan Medical University, 2013, 19(11): 1576-1578

[2] 王蕾, 邬晓敏, 吕庆, 等. 乳腺癌术后辅助化疗患者癌因性疲劳的中医证候特点分析[J]. 北京中医药, 2016, 35(07): 649-652
Wang Lei, Wu Xiao-min, Lv Qing, et al. Characteristics of Traditional Chinese Medicine (TCM) syndromes of cancer-related fatigue (CRF) in breast cancer patients with adjuvant chemotherapy after operation [J]. Beijing Journal of Traditional Chinese Medicine, 2016, 35(07): 649-652

[3] 姜大庆, 谢贤鑫, 赵林, 等. 乳腺外科整复术在乳腺癌保乳根治术中的应用[J].现代肿瘤医学, 2016, 24(9): 1380-1384
Jiang Da-qing, Xie Xian-xin, Zhao Lin, et al. Oncoplastic technique in breast conservation surgery[J]. Journal of Modern Oncology, 2016, 24(9): 1380-1384

[4] 张建, 陈杰, 张新民. 乳腔镜乳腺癌保乳术及腋窝淋巴结清扫 50 例临床分析[J].中华普外科手术学杂志:电子版, 2016, 10(6): 493-496
Zhang Jian, Chen Jie, Zhang Xin-min, et al. Endoscopic breast-conserving therapy in breast cancer breast and axillary lymph node dissection for 50 cases of clinical analysis[J]. Chinese Journal of Operative Procedures of General Surgery (Electronic Version), 2016, 10(6): 493-496

[5] 姜大庆, 谢贤鑫, 赵林,等. 乳腺癌患者保乳整复术应用现状[J].中国肿瘤, 2015, 24(9): 742-746
Jiang Da-qing, Xie Xian-xin, Zhao Lin, et al. The Status of Oncoplastic Surgery for the Patients with Breast Cancer [J]. China Cancer, 2015, 24(9): 742-746

[6] Roozendaal L M, Vane M L G, Dalen T, et al. Clinically node negative breast cancer patients undergoing breast conserving therapy, sentinel lymph node procedure versus follow-up: a Dutch randomized controlled multicentre trial (BOOG 2013-08)[J]. Bmc Cancer, 2017, 17(1): 459

[7] Sagara Y, Freedman R A, Vaz-Luis I, et al. Patient Prognostic Score and Associations With Survival Improvement Offered by Radiotherapy After Breast-Conserving Surgery for Ductal Carcinoma In Situ: A Population-Based Longitudinal Cohort Study[J]. Journal of Clinical Oncology, 2016, 34(11): 1190-1196

[8] 任应梅. 早期乳腺癌保乳手术治疗进展[J].黑龙江医药, 2016, 29(3): 538-540
Ren Ying-mei. Progress of breast conserving surgery for early breast cancer[J]. Heilongjiang Medicine Journal, 2016, 29(3): 538-540

[9] 张珊, 曾繁余, 唐巍, 等. 保乳联合前哨淋巴结活检对老年乳腺癌患者的疗效及对术后生活质量及美容效果的影响[J].实用癌症杂志, 2016, 31(1): 124-127
Zhang Shan, Zeng Fan-yu, Tang Wei, et al. Breast-conserving United with Sentinel Lymph Node Biopsy for Elderly Patients with Breast Cancer and the Impact on Quality of Life after Surgery and Cosmetic Results[J]. The Practical Journal of Cancer, 2016, 31(1): 124-127

[10] 刘晓艳, 李卓, 张海军, 等. 保乳联合前哨淋巴结活检保腋窝在早期乳腺癌治疗中的临床价值[J].河北医药, 2014, 40(6): 837-838
Liu Xiao-yan, Li Zhuo, Zhang Hai-jun, et al. The clinical value of breast conserving combined with sentinel lymph node biopsy in the treatment of early breast cancer [J]. Hebei Medical Journal, 2014, 40 (6): 837-838

[11] 孙荣能, 赵迎春, 陈剑平. 保乳联合前哨淋巴结活检术对早期乳腺癌患者生活质量的影响 [J]. 中国地方病防治杂志, 2017, 32(2): 221-222
Sun Rong-neng, Zhao Ying-chun, Chen Jian-ping. The effect of breast conserving combined with sentinel lymph node biopsy on the quality of life of early breast cancer patients [J]. Chinese Journal of Infection Control, 2017, 32(2): 221-222

[12] 中国抗癌协会乳腺癌专业委员会. 中国抗癌协会乳腺癌诊治指南与规范(2013 版)[J].中国癌症杂志, 2013, 23(8): 637-684
Chinese Anti-Cancer Association, Committee of Breast Cancer Society. Clinical Practice Guidelines in Breast Cancer by Chinese Anti-Cancer Association(2013 version)[J]. China Oncology, 2013, 23 (8): 637-684

[13] Abner A, Harris J. Conservative Management of Breast Cancer: Research at the Joint Center for Radiation Therapy, Harvard Medical School[J]. Breast Journal, 2010, 3(s1): 49-52

[14] 戈允申. 中国人肩关节功能评分系统的研究与制定[D].复旦大学, 2007
Ge Yun-Shen. The Research and Development of a shoulder Functional Scale System in Chinese Abstract [D]. Fudan University, 2007

[15] Group E B C T C, Coleman R, Powles T, et al. Adjuvant bisphosphonate treatment in early breast cancer: meta-analyses of individual patient data from randomised trials [J]. Lancet, 2015, 386 (10001): 1353-1361

[16] 张彦收, 刘运江. 乳腺癌手术治疗回顾和进展 [J]. 现代肿瘤医学, 2015, 23(5): 719-722
Zhang Yan-shou, Liu Yun-jiang. A review for the surgical management of breast cancer and the latest developments [J]. Journal of Modern Oncology, 2015, 23(5): 719-722

[17] 李剑, 赵二保, 田园. 保乳手术治疗早期乳腺癌的疗效观察[J].中国药物与临床, 2015, 15(9): 1289-1290
Li Jian, Zhao Er-bao, Tian Yuan. Observation of the curative effect of breast conserving surgery on early breast cancer[J]. Chinese Remedies & Clinics, 2015, 15(9): 1289-1290

[18] 易瑛, 蒋雪梅, 雷海, 等. 保乳手术与改良根治术对早期乳腺癌患者生活质量的影响[J] 临床肿瘤学杂志, 2016, 21(7): 638-641
Yi Ying, Jiang Xue-wei, Lei Hai, et al. Effect of breast-conserving surgery with modified radical mastectomy on the quality of life in patients with early-stage breast cancer[J]. Chinese Clinical Oncology,

2016, 21(7): 638-641

[19] Bartelink H, Maingon P, Poortmans P, et al. Whole-breast irradiation with or without a boost for patients treated with breast-conserving surgery for early breast cancer: 20-year follow-up of a randomised phase 3 trial[J]. Lancet Oncology, 2015, 16(1): 47-56

[20] 李彬. 早期乳腺癌患者应用保乳术和改良根治术的效果对比[J].中国现代药物应用, 2014, 8(3): 101-102
Li Bin. Comparison of the effect of breast conserving and modified radical mastectomy for patients with early breast cancer [J]. Chinese Journal of Modern Drug Application, 2014, 8(3): 101-102

[21] 王万贵. 早期乳腺癌运用保乳手术治疗的效果评价[J].现代诊断与治疗, 2015, 26(22): 5183-5184
Wang Wan-gui. Evaluation of the effect of breast conserving surgery for early breast cancer [J]. Modern Diagnosis & Treatment, 2015, 26 (22): 5183-5184

[22] 于文龙, 鹿彦, 关洪亮. 不同术式早期乳腺癌腋窝淋巴结清扫术疗效对比观察[J].山东医药, 2013, 53(34): 57-58
Yu Wen-long, Lu Yan, Guan Hong-liang. Comparative observation of the effect of axillary lymph node dissection for early breast cancer with different surgical procedures [J]. Shandong Medical Journal, 2013, 53(34): 57-58

[23] Geng C, Chen X, Pan X, et al. The Feasibility and Accuracy of Sentinel Lymph Node Biopsy in Initially Clinically Node-Negative Breast Cancer after Neoadjuvant Chemotherapy: A Systematic Review and Meta-Analysis[J]. Plos One, 2016, 11(9): e0162605

[24] 何婕, 莫钦国. 前哨淋巴结活检术与腋窝淋巴结清扫术对早期乳腺癌患者生活质量的影响[J].山东医药, 2014, 54(2): 57-59
He Jie, Mo Qin-guo. The effect of sentinel lymph node biopsy and axillary lymph node dissection on the quality of life of early breast cancer patients[J]. Shandong Medical Journal, 2014, 54(2): 57-59

[25] 杨亮, 王晓文, 李涌涛, 等. 前哨淋巴结活检及腋窝淋巴结清扫术后对老年早期乳腺癌患者肩部功能的影响[J].中国老年学, 2013, 33(2): 282-284
Yang Liang, Wang Xiao-wen, Li Yong-tao, et al. The effect of sentinel lymph node biopsy and axillary lymph node dissection on the shoulder function of the elderly patients with early breast cancer [J]. Chinese Journal of Gerontology, 2013, 33(2): 282-284

[26] Zada A, Peek M C, Ahmed M, et al. Meta-analysis of sentinel lymph node biopsy in breast cancer using the magnetic technique [J]. Br J Surg, 2016, 103(11): 1409-1419

[27] 祝琴, 孙治君. 乳腺癌前哨淋巴结活检技术的相关因素及研究现状[J].重庆医学, 2015, 44(14): 1988-1991
Zhu Qin, Sun Zhi-jun. Related factors and research status of sentinel lymph node biopsy in breast cancer [J]. Chongqing Medicine, 2015, 44(14): 1988-1991

[28] 彭歆, 徐贵颖, 王长青, 等. 保乳联合前哨淋巴结活检在 50 例早期乳腺癌治疗中的临床价值 [J]. 中国妇幼保健, 2014, 29(35): 5935-5937
Peng Xin, Xu Gui-ying, Wang Chang-qing, et al. The clinical value of breast conserving combined with sentinel lymph node biopsy in the treatment of 50 cases of early breast cancer [J]. Maternal & Child Health Care of China, 2014, 29(35): 5935-5937

[29] 王宏, 曹旭晨, 杨绍时, 等. 保乳联合前哨淋巴结活检术治疗早期乳腺癌患者 80 例临床观察[J].山东医药, 2015, 55(45): 54-56
Wang Hong, Cao Xu-chen, Yang Shao-shi, et al. Clinical observation of 80 cases of early breast cancer treated with breast conserving and sentinel lymph node biopsy [J]. Shandong Medical Journal, 2015, 55 (45): 54-56

[30] Dash I, Batt J, Klepsch P, et al. Sentinel lymph node biopsy under ultrasound guided block allows for safe breast cancer surgery under local anaesthetic[J]. European Journal of Surgical Oncology, 2016, 42 (5): S39-S40

（上接第 4324 页）

Meng Ling-xin, Han Jing, Zhou Dan-dan, et al. Correlation between three-dimensional conformal intensity-modulated radiotherapy and radiation-induced lung injury in patients with squamous cell carcinoma of middle and lower esophagus [J]. China Medicine, 2018, 13(1): 80-84

[23] Li H, Liu G, Xia L, et al. A polymorphism in the DNA repair domain of APEX1 is associated with the radiation-induced pneumonitis risk among lung cancer patients after radiotherapy[J]. Br J Radiol, 2014, 7 (1040): 20140093

[24] Lee JG, Park S, Bae CH, et al. Development of a minipig model for lung injury induced by a single high-dose radiation exposure and evaluation with thoracic computed tomography [J]. J Radiat Res, 2016, 57(3): 201-209

[25] Murigi FN, Mohindra P, Hung C, et al. Dose Optimization Study of AEOL 10150 as a Mitigator of Radiation-Induced Lung Injury in CBA/J Mice[J]. Radiat Res, 2015, 184(4): 422-432

[26] Haefner MF, Lang K, Verma V, et al. Intensity-modulated versus 3-dimensional conformal radiotherapy in the definitive treatment of esophageal cancer: comparison of outcomes and acute toxicity [J]. Radiat Oncol, 2017, 12(1): 131

[27] Cui Z, Tian Y, He B, et al. Associated factors of radiation pneumonitis induced by precise radiotherapy in 186 elderly patients with esophageal cancer [J]. Int J Clin Exp Med, 2015, 8 (9): 16646-16651

[28] Kim HJ, Suh YG, Lee YC, et al. Dose-Response Relationship between Radiation Dose and Loco-regional Control in Patients with Stage II-III Esophageal Cancer Treated with Definitive Chemoradiotherapy[J]. Cancer Res Treat, 2017, 49(3): 669-677

[29] Ito M, Shimizu H, Aoyama T, et al. Efficacy of virtual block objects in reducing the lung dose in helical tomotherapy planning for cervical oesophageal cancer: a planning study [J]. Radiat Oncol, 2018, 13(1): 62

[30] 宋永浩,夏炎春,周诚忠,等.调强适形放疗致老年食管癌放射性肺损伤的相关因素分析[J].现代肿瘤医学, 2017, 25(2): 224-226
Song Yong-hao, Xia Yan-chun, Zhou Cheng-zhong, et al. Analysis of factors of radiation -induced lung injury with IMRT for elderly esophageal car-cinoma patients [J]. Journal of Modern Oncology, 2017, 25(2): 224-226