

doi:10.3971/j.issn.1000-8578.2012.08.031

老年食管癌三维适形与调强放射治疗疗效比较

王玉祥,王 军,祝淑钗,田丹丹,吕冬捷,王 玮,乔学英

Comparison of Prognosis on Esophageal Carcinoma Treated with 3D-CRT and IMRT for Elderly Patients

Wang Yuxiang, Wang Jun, Zhu Shuchai, Tian Dandan, Lv Dongjie, Wang Yi, Qiao Xueying
Department of Radiation Oncology, The Fourth Hospital of Hebei Medical University, Shijiazhuang 050011, China
Corresponding Author: Wang Jun, E-mail: wangyuxiang69@sohu.com

Abstract: Objective To compare the prognosis of esophageal carcinoma treated with 3-dimensional conformal radiotherapy (3D-CRT) and intensity modulated radiation therapy (IMRT) for patients older than 65 years; and to analysis the related factors affected the prognosis. **Methods** From January 2001 to December 2008, 105 cases of elderly patients with esophageal carcinoma were treated with 3D-CRT and 48 cases with IMRT. Local control rates, survival rates and its related prognostic factors were evaluated retrospectively with SSPS11.5 software. **Results** After the treatment with 3D-CRT or IMRT, there was 71 cases in CR, 78 in PR, and 4 in NR. The total efficiency (CR + PR) was 97.4%. The 1 and 3-year overall survival rate was 70.6% and 34.2%, respectively; and the 1- and 3-year local control rate was 76.2% and 51.1%, respectively. Compared with the clinical data between 3D-CRT and IMRT, there were more patients with metastasis of lymph node, located in middle and lower-thoracic carcinoma, larger diameter of tumor in CT, higher dose of radiotherapy agents, and more patients was combination of chemotherapy in IMRT group ($P<0.05$). There were no significant differences in the effects of gender, age, T stage and diet before radiotherapy and lesion length bariesophagogram between the two groups ($P>0.05$). There were no significant differences in the 1- and 3-year survival rate and free-recurrence rate between 3D-CRT and IMRT groups ($P>0.05$). For all patients, analyzed by univariate analysis, the related factors affected on the prognosis were the different diet, site of lesion, T stage, metastasis of lymph node, lesion length in barium esophagogram and CT image, chemotherapy and the immediate response ($P<0.05$). By Cox multivariate analysis, the independent factors affected on the prognosis were chemotherapy and the largest diameter of lesion in CT scanning image ($P<0.05$). **Conclusions** 3D-CRT and IMRT can be considered as effective and feasible approaches for elderly patients with esophageal cancer. Chemotherapy and the largest diameter of lesion in CT scanning image were independent prognostic factors for those patients.

Key words: Esophageal neoplasms/Elder patients; 3D-CRT / IMRT; Survival; Prognosis

摘 要:目的 比较老年食管癌三维适形放射治疗(3D-CRT)或调强放疗(IMRT)的疗效及其预后相关因素。**方法** 回顾性分析 153 例 65 岁以上老年食管癌患者的临床资料,105 例行 3D-CRT,48 例行 IMRT,采用 SPSS11.5 统计软件比较分析生存率及预后影响因素。**结果** 放疗后食管造影评价 CR 71 例、PR 78 例、NR 4 例,总有效率(CR + PR)为 97.4%;全组 1、3 年生存率和局部控制率分别为 70.6%、34.2%和 76.2%、51.1%。3D-CRT 与 IMRT 组资料相比,IMRT 组胸中下段及淋巴结转移者较多、CT 食管肿瘤最大径较大、放疗剂量更高、联合化疗者更多($P<0.05$);而性别、年龄、T 分期、放疗前进食情况及食管造影长度两组间比较差异无统计学意义($P>0.05$)。3D-CRT 与 IMRT 组 1、3 年生存率和局部控制率比较,差异无统计学意义($P>0.05$),分层分析中两组生存率比较,差异无统计学意义($P>0.05$)。全组单因素分析显示,治疗前进食情况、病变部位、T 分期、淋巴结转移与否、食管造影显示病变长度、CT 肿瘤最大直径、化疗和近期疗效与预后生存有关($P<0.05$);Cox 多因素分析仅化疗和 CT 肿瘤最大直径为独立预后因素($P<0.05$)。**结论** 老年食管癌 IMRT 与 3D-CRT 比较无明显生存优势,联合化疗及肿瘤最大直径小者放疗疗效较好,但需进一步前瞻性研究。

收稿日期:2011-10-20;修回日期:2012-02-02
基金项目:河北省卫生厅资助课题(06004,08162)
作者单位:050011 石家庄,河北医科大学第四医院放疗科
通信作者:王军, E-mail: wangyuxiang69@sohu.com
作者简介:王玉祥(1969-),男,博士,副教授,主要从事食管癌放疗的基础及临床研究

关键词: 食管肿瘤/老年;三维适形放射疗法/调强适形放射疗法;生存分析;预后
中图分类号:R735.1;R730.55
文献标识码:A
文章编号:1000-8578(2012)08-1008-06

0 引言

三维适形放疗(3-dimensional conformal radiation therapy,3D-CRT)技术临床应用越来越广泛,食管癌 3D-CRT 与常规模拟机定位技术相比有明显的剂量学优势^[1-2];而调强放射治疗(intensity modulated radiation therapy,IMRT)与 3D-CRT 相比更具剂量学优势^[3-5];IMRT 与 3D-CRT 相比能否进一步提高食管癌生存率,尚无相关报道。我们的前期研究已报道我科食管癌行 3D-CRT 或 IMRT 的临床疗效^[6-7],在此基础上进一步比较行 3D-CRT 或 IMRT 的 153 例 65 岁以上老年食管癌患者的临床资料,比较两者疗效及预后影响因素。

1 资料与方法

1.1 临床资料

收集 2001 年 1 月—2008 年 12 月在我院行根治性 3D-CRT 或 IMRT 的 153 例 65 岁以上老年食管癌患者的临床资料。其中男 99 例,女 54 例;中位年龄 72 岁(65~90 岁)。病变部位:颈段 17 例、胸上段 49 例、胸中段 70 例、胸下段 17 例。髓质型 134 例、菌伞型 12 例、缩窄型 1 例、溃疡型 6 例。病理类型:鳞癌 133 例、腺癌 3 例、小细胞癌 1 例,病理未证实者 16 例。食管造影显示病变中位长度 5.0 cm(范围 1.3~11.5 cm)。CT 显示食管肿瘤最大直径中位值为 3.7 cm(范围 1.5~6.8 cm)。治疗前进普食 32 例、半流食 108 例,仅能进流食 13 例。按照 2003 年 UICC 食管癌 T 分期标准:T1~3 者 69 例、T4 者 84 例;无淋巴结转移者 89 例、有淋巴结转移者 64 例。

1.2 放射治疗

153 例中采用全程 3D-CRT 者 81 例;采用后半程 3D-CRT 者 24 例,其前程常规模拟机定位,采用 6MVX 直线加速器治疗,常规分割处方剂量 DT 为每 0.6~4 周(6~40)Gy/(3~20)次。48 例采用 IMRT,全组放疗总处方剂量 DT 为每 5~7 周(50~70)Gy/(25~35)次,中位剂量 66 Gy。适形定位及靶区勾画同文献^[6-7]。

1.3 化疗

153 例中 106 例未行化疗,47 例行顺铂、氟尿嘧啶为基础化疗[顺铂(20~40)mg/(3~5)d,氟尿嘧啶(0.5~1.0)g/(3~5)d],其中完成 1 周期者 12 例、2 周期者 12 例、3 周期者 6 例、4 周期者 11 例、6 周期者 6 例。19 例为同期放化疗、28 例为序贯放化疗。

1.4 近期疗效及不良反应评价

近期疗效评价采用万钧食管癌放射治疗后近期疗效评价标准。急性放射性食管炎和放射性肺炎参照不良反应常见术语标准 3.0 版标准评价。

1.5 随访

自放疗开始之日计算生存期,随访截至 2008 年 12 月 31 日。失访 2 例,随访率 98.7%。生存期从放疗开始日计算,终止时间为死亡日期或末次随访日期。

1.6 统计学方法

采用 SPSS11.5 统计软件分析,单因素生存分析应用 Kaplan-Meier 法,组间比较采用双尾的 Logrank 法;多因素分析采用 Cox 回归模型, $P<0.05$ 为差异有统计学意义。

2 结果

2.1 总体生存情况及近期疗效

至随访终止日期已死亡 96 例,死于局部复发或未控者 44 例(45.8%),死于远处转移 19 例(19.8%,其中 9 例多发转移,常见转移部位为纵隔及腹腔淋巴结、肝和肺脏等)。死于局部复发伴远处转移者 7 例(7.3%);其他原因死亡者 26 例,其中死于全身衰竭 5 例、呼吸衰竭 2 例、冠心病 7 例、放射性肺炎 2 例、脑溢血 1 例、不明原因者 7 例、失访 2 例。153 例中,发生 0~1、2、3 级急性期放射性食管炎分别为 81、53、19 例。发生 0、1、2、3、4、5 级急性放射性肺炎分别为 95、36、14、4、1 和 3 例。放疗后食管造影评价 CR 71 例,PR 78 例,NR 4 例;总有效率(CR+PR)为 97.4%;全组 1、2、3 年局部控制率为 76.2%、61.25%和 51.1%;全组 1、2、3 年生存率分别为 70.6%、45.5%和 34.2%,中位生存期 20 月。

2.2 3D-CRT 与 IMRT 临床资料比较

3D-CRT 与 IMRT 组资料相比,性别、年龄、T 分期、放疗进食情况及食管造影长度两组间比较差异无统计学意义($P>0.05$);而食管原发肿瘤部位、淋巴结转移、CT 食管肿瘤最大径、放疗剂量和化疗与否两组间比较差异有统计学意义($P<0.05$);IMRT 组胸中下段及淋巴结转移者较多、CT 食管肿瘤最大径较大、放疗剂量更高、联合化疗者也更多。放疗后 IMRT 组近期疗效好于 3D-CRT($P<0.05$);但放射性食管炎和放射性肺炎发生率以及局部控制率两组间比较差异无统计学意义($P>0.05$),见表 1。

表 1 老年食管癌 3D-CRT 与 IMRT 临床资料比较

Table 1 Comparison of clinical data between 3D-CRT and IMRT for elder patients with esophageal cancer

Item	Radiotherapy		Statistics	
	3D-CRT	IMRT	χ^2	P
Gender				
Male	70	29	0.56	0.453
Female	35	19		
Age(years)				
≤72	55	30	1.37	0.242
>72	50	18		
Location in the esophagus				
Cervical and upper-thoracic	56	10	14.19	0.000
Middle an lower-thoracic	49	38		
Diet				
General diet	27	5	4.81	0.090
Semi-liquid diet	69	39		
Liquid diet	9	4		
Length of lesion in esophagogram(cm)				
≤5	52	27	0.60	0.440
>5	53	21		
T stage				
T1~3	46	23	0.22	0.636
T4	59	25		
Metastasis of lymph node				
Yes	32	32	17.73	0.00
No	73	16		
The largest diameter of tumor in CT scanning image(cm)				
≤4	78	27	4.98	0.026
>4	27	21		
Chemotherapy				
Yes	23	24	12.22	0.000
No	82	24		
Dose of PTV(Gy)				
<66	60	13	11.93	0.001
≥66	45	35		
Recient efficacy				
CR	38	33	14.04	0.000
PR + NR	67	15		
Radiation induced esophagitis				
0~1	58	23	0.71	0.400
≥2	47	25		
Radiation induced pneumonitis				
0~1	90	41	0.00	0.961
≥2	15	7		
Local recurrence				
Yes	41	12	2.87	0.090
No	64	36		

Note:3D-CRT:3-dimensional conformal radiation therapy;IMRT:intensity modulated radition therapy

2.3 D-CRT 与 IMRT 组间预后生存比较

3D-CRT 组放疗后 1、2、3 年生存率和中位生存期分别为 66.7%、43.0%、32.5%和 18 月,IM-RT 组放疗后 1、2、3 年生存率和中位生存期分别为 79.2%、51.0%、37.8%和 26 月($\chi^2=0.82,P=0.365$)。3D-CRT 与 IMRT 组放疗后 1、2、3 年局部控制率分别为 74.3%、59.5%、47.9%和 80.2%、59.8%、59.8%($\chi^2=0.99,P=0.319$)。两组资料欠均衡,遂进行分层分析。结果显示,性别、年龄、食管原发肿瘤部位、T 分期、淋巴结转移、放疗前进食情况、食管造影长度、CT 食管肿瘤最大径、放疗剂量和化疗与否这些因素中,3D-CRT 与 IMRT 组间生存率比较差异无统计学意义($P>0.05$),见表 2。

2.4 全组预后生存分析

单因素分析表明,治疗前进食情况、病变部位、T 分期、淋巴结转移与否、食管造影显示病变长度、CT 肿瘤最大直径、化疗和近期疗效与预后生存有关($P<0.05$);而性别、年龄、照射方式(3D-CRT/IMRT)和放疗剂量与预后无关($P>0.05$)。Cox 多因素分析仅化疗和 CT 肿瘤最大直径为独立预后因素($P<0.05$),见表 3。

3 讨论

放射治疗是老年食管癌重要的治疗方法之一。既往国内文献报道老年食管癌常规放疗后 1、3、5 年生存率分别 42.9%~60.8%、10.7%~20.7%、7.1%~12.5%之间^[8-9];与国外学者 Kosugi 等^[10]和 Kawashima 等^[11]报道结果基本一致。3D-CRT 或 IMRT 应用后,可以使食管肿瘤靶区处方剂量分布更加合理,也有可能提高局控率和生存率。本研究中 153 例 65 岁以上老年食管癌患者采用三维适形放疗(3D-CRT)或调强放疗(IMRT),结果 1、2、3 年生存率分别为 70.6%、45.5%和 34.2%;与既往文献报道结果基本一致^[6,12-14]。提示老年食管癌行 3D-CRT 或 IMRT 是安全可行的,疗效与非老年食管癌者相似。

本组资料中,3D-CRT 与 IMRT 组临床资料欠均衡,IMRT 组胸中下段居多、淋巴结转移者较多、CT 显示食管肿瘤最大径也较大,提示病期较晚;而且 IMRT 组放疗剂量高、联合化疗者更多。但 3D-CRT 与 IMRT 组放疗后 1、3 年生存率比较无明显差异,局部控制率两组也无明显差异;而且两组急性期放射性肺炎和放射性食管炎发生率也相似。进一步按照性别、年龄、原发瘤部位、T 分期、有无淋巴结转移、放疗剂量、化疗与否等临床及治疗因素分层分

表 2 老年食管癌 3D-CRT 与 IMRT 预后单因素比较

Table 2 Comparison of prognosis between 3D-CRT and IMRT by univariate analysis in elderly patients with esophageal cancer

Item	Treatment	Cases	Survival(%)			Median (month)	χ^2	P
			1 year	2 year	3 year			
Gender								
Male	3D-CRT	70	67.1	45.0	33.4	19.0	0.04	0.836
	IMRT	29	72.4	51.5	27.5	26.0		
Female	3D-CRT	35	65.7	38.7	31.3	17.0	1.42	0.233
	IMRT	19	89.5	49.9	49.9	19.0		
Age(years)								
≤ 72	3D-CRT	55	69.1	52.3	37.7	28.0	0.23	0.635
	IMRT	30	73.3	57.2	57.2	27.2		
>72	3D-CRT	50	64.0	32.7	26.9	14.5	0.53	0.53
	IMRT	18	88.9	40.8	20.4	22.0		
Location in the esophagus								
Cervical and upper-thoracic	3D-CRT	56	73.2	51.7	40.4	29.0	0.32	0.572
	IMRT	10	80.0	66.7	66.7	21.3		
Middle an lower-thoracic	3D-CRT	49	59.2	32.3	23.5	15.5	2.01	0.156
	IMRT	38	79.0	48.7	35.5	22.0		
Metastasis of lymph node								
Yes	3D-CRT	32	43.8	26.3	18.0	11.5	2.13	0.145
	IMRT	32	71.9	45.2	33.9	19.0		
No	3D-CRT	73	75.3	50.0	39.1	27.5	0.38	0.356
	IMRT	16	93.8	61.8	49.5	26.0		
T								
T1~3	3D-CRT	46	76.1	50.6	41.2	27.5	2.82	0.093
	IMRT	23	90.6	76.8	49.3	31.0		
T4	3D-CRT	59	59.3	30.0	26.6	14.0	0.25	0.613
	IMRT	25	64.0	24.0	24.0	15.0		
Length of lesion in esophagogram (cm)								
≤ 5	3D-CRT	52	76.9	56.8	43.4	29.0	0.03	0.873
	IMRT	27	81.5	61.9	42.5	31.0		
>5	3D-CRT	53	56.6	29.3	21.2	13.2	0.76	0.383
	IMRT	21	76.2	34.2	34.2	16.0		
The largest diameter of tumor in CT scanning image(cm)								
≤ 4	3D-CRT	78	75.6	51.5	38.8	28.0	1.39	0.238
	IMRT	27	85.2	69.5	48.6	31.0		
>4	3D-CRT	27	40.7	18.5	13.9	11.0	1.67	0.197
	IMRT	21	71.4	24.7	24.7	15.0		
Recent efficacy								
CR	3D-CRT	38	81.6	62.4	43.6	30.2	0.21	0.645
	IMRT	33	78.8	54.9	40.1	26.0		
PR + NR	3D-CRT	67	61.2	31.9	26.1	15.5	0.59	0.443
	IMRT	15	80.0	44.4	44.4	16.0		
Dose(Gy)								
<66	3D-CRT	60	63.3	41.5	26.0	18.0	0.37	0.542
	IMRT	13	67.7	58.0	37.0	20.0		
≥ 66	3D-CRT	45	71.1	44.4	37.8	17.6	0.21	0.649
	IMRT	35	77.1	50.8	37.1	26.0		
Chemotherapy								
Yes	3D-CRT	23	73.9	69.6	56.9	44.0	1.09	0.296
	IMRT	23	75.0	51.9	25.9	31.0		
No	3D-CRT	82	64.6	35.5	26.2	17.0	0.94	0.333
	IMRT	24	83.3	48.5	40.4	16.0		

表 3 老年食管癌 3D-CRT/IMRT 预后 Cox 分析

表 3 Prognostic factors in elderly patients with esophageal carcinoma after the treatment of 3D-CRT or IMRT analyzed by Cox

Item/Groups	B	SE	Wald	P	Exp(B)	95.0% CI for Exp(B)	
						Lower	Upper
Metastasis of lymph node							
Yes/No	- 0.492	0.279	3.119	0.077	0.611	0.354	1.056
Tstage							
T4/T1~3	0.155	0.278	0.312	0.576	1.168	0.678	2.013
Chemotherapy							
Yes/No	0.917	0.356	6.640	0.010	2.501	1.245	5.022
Location of lesion							
Cervical and upper- thoracic /Middle and lower- thoracic	0.195	0.265	0.542	0.461	1.215	0.723	2.043
Recent efficacy							
CR/PR+ NR	0.393	0.299	1.730	0.188	1.482	0.825	2.664
Length of lesion in esophagogram (cm)							
≤5/>5	0.095	0.269	0.124	0.725	1.100	0.649	1.864
The largest diameter of tumor in CT scanning image(cm)							
≤4/>4	0.987	0.267	13.707	0.000	2.682	1.591	4.522

析,结果 3D-CRT 与 IMRT 组生存率也均无明显差异;提示 IMRT 与 3D-CRT 组相比,未显示明显的生存优势;也可能与两组资料欠均衡、资料为回顾性、随访期偏短等因素有关。既往资料显示^[3-5],IMRT 与 3D-CRT 组相比,IMRT 对胸上段食管癌剂量学优势更明显,但能否转化为生存收益,尚无文献报道;本组资料 IMRT 组胸上段食管癌仅 10 例,与 3D-CRT 组相比生存率无明显差异,需要进一步积累病例及前瞻性研究证实。

就全组资料而言,化疗与食管肿瘤最大直径是影响老年食管癌患者的独立预后因素。IMRT 或 3D-CRT 合并化疗者预后生存明显好于未化疗者,与文献报道结果一致^[14-16]。文献报道^[17-18],老年食管癌行同期化疗是可以耐受的;本组资料结果也显示化疗与未化疗者放射性肺炎和放射性食管炎发生率相似,但本组仅部分病例采用同期放化疗,且放疗剂量偏低、化疗周期数偏少,本组中采用化疗者年龄均≤75 岁,因此老年人食管癌同期放化疗临床应用时,不良反应仍需临床慎重考虑,高龄者放化疗联合应用时更须谨慎。本组资料中,T 分期及淋巴结转移与否是影响老年食管癌适形放疗预后的因素,但不是独立预后因素;而食管肿瘤最大直径是影响预后的重要因素,与文献报道结果基本一致^[18]。放疗与手术不同,肿瘤靶体积大小对预后的影响可能要比肿瘤外浸程度重要;我国食管癌非手术临床分期中已将食管肿

瘤最大直径及肿瘤长度加入分期标准中供临床应用^[19]。本研究结果提示,食管肿瘤最大直径对适形放疗预后的影响要比肿瘤长度更为重要。另外,放疗剂量大小也不是影响老年食管癌预后生存的主要因素,与我科既往报道结果基本一致^[6,13,18]。

总之,老年食管癌行 3D-CRT 或 IMRT 是安全可行的,但两者预后无明显差异;联合化疗可以提高放疗疗效,但临床应用需谨慎;食管肿瘤最大直径大小也是影响预后的重要因素。

参考文献:

[1] Xiao ZF,Zhang Z,Zhang HZ,et al. Assessment of tumor dose distribution in three dimensional conformal radiotherapy treatment planning system for esophageal cancer[J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2004,13(4):273-7. [肖泽芬,章众,张宏志,等,用三维治疗计划系统评估食管癌常规放射治疗中肿瘤剂量的分布[J]. 中华放射肿瘤学杂志,2004,13(4):273-7.]

[2] Wang L,Han CH,Zhu SC,et al. Dosimetry study on conventional and three dimensional conformal radiotherapy for esophageal cancer[J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2006,15(3):176-80. [王澜,韩春,祝淑叔,等. 食管癌常规照射与三维适形放疗的剂量学研究[J]. 中华放射肿瘤学杂志,2006,15(3):176-80.]

[3] Wang SL,Liao Z,Liu H,et al. Intensity-modulated radiation therapy with concurrent chemotherapy for locally advanced cervical and upper thoracic esophageal cancer[J]. World J Gastroenterol,2006,12(34):5501-8.

[4] Wang J,Zhu SC,Han C,et al. Comparison of dose distribufions between conformal and intensity. modulated radiotherapy for the upper esophageal carcinoma[J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2008,17(4):275-9. [王军,祝淑钗,韩春,等. 胸上段食管癌三维适形和调强放疗剂量学对比研究[J]. 中华放射肿瘤学杂志,2008,17(4):275-9.]

[5] Zhang ZW,Chen ZJ,Li DR,et al. Dosimetric comparison between intensity-modulated radiotherapy and conformal radiotherapy for upper thoracic esophageal carcinoma[J]. Ai Zheng,2009,28(11):1127-31. [张武哲,陈志坚,李德锐,等. 胸上段食管癌调强放疗与适形放疗计划的剂量学比较[J]. 癌症,2009,28(11):1127-31.]

[6] Wang YX,Zhu SC,Li J,et al. Prognostic analysis of three-dimensional conformal radiotherapy (3DCRT) for 209 cases of esophageal carcinoma[J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2010,19(2):101-4. [王玉祥,祝淑钗,李娟,等. 209 例食管癌三维适形放疗疗效分析[J]. 中华放射肿瘤学杂志,2010,19(2):101-4.]

[7] Wang J,Han C,Li XN,et al. Short-term efficacy of intensity-modulated radiotherapy on esophageal carcinoma [J]. Ai Zheng,2009,28(11):1138-41. [王军,韩春,李晓宁,等. 食管癌调强放射治疗初期疗效分析[J]. 癌症,2009,28(11):1138-41.]

[8] Guo YX. Clinical investigation on the efect and complication of accelerated hyper-fractionation for elderly patients with esophageal carcinoma[J]. Zhongguo Zhong Liu Lin Chuang,2006,33(7):386-8. [郭跃信. 老年食管癌加速超分割放射治疗的临床探讨[J]. 中国肿瘤临床,2006,33(7):386-8.]

[9] Li GW,Guo YX. Radiotherapy of esophageal cancer for elder patients more than 80 years[J]. Zhonghua Lao Nian Yi Xue Za Zhi,2007,26(3):202-3. [李国文,郭跃信. 80 岁以上老年人食管癌的放射治疗[J]. 中华老年医学杂志,2007,26(3):202-3.]

[10] Kosugi S,Sasamoto R,Kanda T,et al. Retrospective review of surgery and definitive chemoradiotherapy in patients with squamous cell carcinoma of the thoracic esophagus aged 75 years or older[J]. Jpn J Clin Oncol,2009,39(6):360-6.

[11] Kawashima M,Kagami Y,Toita T,et al. Prospective trail of radiotherapy for patients 80 years of age or older with squamous cell carcinoma of the thoracic esophagus[J]. Int J Radiat oncol Biol Phys,2006,64(4):1112-1.

[12] Jiang J,Wang QF,Xiao ZF,et al. Efficacy of three-dimensional conformal radiotherapy for 132 patients with esophageat carcinoma [J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2009,18(1):47-51. [蒋杰,王奇峰,肖泽芬,等. 132 例食管癌三维适形放疗的疗效分析[J]. 中华放射肿瘤学杂志,2009,18(1):47-51.]

[13] Wang YX,Zhu SC,Su JW,et al. Prognostic analysis of three-dimensional conformal radiotherapy for elderly patients with esophageal carcinoma[J]. Zhonghua Lao Nian Yi Xue Za Zhi,2010,29(2):131-4. [王玉祥,祝淑钗,苏景伟,等. 老年人食管癌三维适形放射治疗疗效分析[J]. 中华老年医学杂志,2010,29(2):131-4.]

[14] Wan X,Qiao XY,Wang YD,et al. Aanlysisi of treatment outcome and prognostic factor with three-dimensional conformal radiotherapy for thoracic esophageal squamous cell carcinoma[J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2011,20(3):202-4. [万欣,乔学英,王雅棣,等. 131 例食管鳞癌三维适形放疗预后因素分析[J]. 中华放射肿瘤学杂志,2011,20(3):202-4.]

[15] Chen EC,Liu MZ,Hu YH,et al. A case-contral study on unresectable esophageal carcinoma patients with radiochemotherapy or radiotherapy [J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2007,16(5):416-9. [陈尔成,刘孟忠,胡永红,等. 同期放化疗与单纯放疗不能手术食管癌的病例对照研究[J]. 中华放射肿瘤学杂志,2007,16(5):416-9.]

[16] Nallapareddy S,Wilding GE,Yang G,et al. Chemoradiation is a tolerable therapy for older adults with esophageal cancer[J]. Anticancer Res,2005,25(4):3055-60.

[17] Anderson SE,Minsky BD,Bains M,et al. Combined modality chemoradiation in elderly oesophageal cancer patients[J]. Br J Cancer,2007,96(12):1823-7.

[18] Zhu SC,Li R,Wang YX,et al. Prognostic factors of locally advanced esophageal carcinoma treated by radiotherapy alone[J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2005,14(4):253-8. [祝淑钗,李任,王玉祥,等. 500 例中晚期食管癌单纯放疗的多因素分析[J]. 中华放射肿瘤学杂志,2005,14(4):253-8.]

[19] Chinese expert group of clinical stage for non surgery esophageal cancer. Criterion of clinical stage for non surgery esophageal cancer[J]. Zhonghua Fang She Zhong Liu Xue Za Zhi,2010,19(3):179-80. [中国非手术治疗食管癌临床分期专家小组. 非手术治疗食管癌的临床分期标准[J]. 中华放射肿瘤学杂志,2010,19(3):179-80.]

[编辑校对:周永红]