宫颈癌放疗仰、俯卧位固定下的摆位误差及剂量学差异探讨

《现代肿瘤医学》[ISSN:1672-4992/CN:61-1415/R] 期数: 2019年21期 页码: 3862-3865 栏目: 论著(放射治疗) 出版日期: 2019-09-30

Title: Study on placement error and dosimetric difference of cervical cancer in supine and prone position

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关键词: 宫颈癌; CBCT; 仰卧位; 俯卧位; 摆位误差; 危及器官

Keywords: cervical cancer; cone beam computed tomography(CBCT); supine position; prone position; placement error; endangered organ

分类号: R737.33

DOI: 10.3969/j.issn.1672-4992.2019.21.029

文献标识码: A

摘要: 目的：对比研究宫颈癌调强放疗中行仰卧位与俯卧位的两种固定方式时的摆位误差及剂量学差异。方法：随机选取64例宫颈癌患者分成两组，每组32例，分别选取仰卧位和俯卧位方式固定。两组患者均行首次摆位、摆位误差纠正及治疗期间的CBCT扫描，将CBCT扫描图像与治疗计划CT图像自动匹配配准，分别得到X轴（左右方向）、Y轴（头脚方向）、Z轴（腹背方向）的摆位误差数据；同时通过TPS计算两组病例靶区的D95、Dmean、CI、HI以及危及器官小肠、膀胱、直肠、结肠、股骨头、盆骨、脊髓、乙状结肠分别在等剂量线包含的体积百分比下的剂量值大小。结果：仰卧位患者与俯卧位患者在X、Y、Z轴方向平均误差分别为［（2.55±1.21） mm，（2.13±1.12） mm］、［（4.01±1.16） mm，（2.44±1.57） mm］、［（3.46±1.43） mm，（2.89±1.21） mm］。俯卧位固定组X、Y、Z轴方向平均误差均小于仰卧位固定组，且均具有统计学差异（P<0.05）；在靶区的D95、Dmean、CI、HI均不具有统计学差异（P>0.05），除股骨头、盆骨、脊髓、乙状结肠外，俯卧位固定组的危及器官小肠、膀胱、直肠、结肠在等剂量线包含的体积百分比下的剂量值明显小于仰卧位固定组，且均具有统计学差异（P<0.05）。结论：在宫颈癌调强放疗中，与仰卧位固定相比，俯卧位固定可明显减少其摆位误差，以及在靶区受量归一一致的情况下，更好地保护了危及器官。

Abstract: Objective：To compare the placement error and dosimetric difference between the two methods of supine and prone position in cervical cancer intensity-modulated radiotherapy.Methods：We randomly selected 64 patients with cervical cancer and divided them into two groups，32 in each group，and were placed in the supine and prone position.The two groups of patients were subjected to CBCT scan after the first placement，correction of the placement error and during the treatment.Then，the images of the CBCT scan were automatically matched with the CT images of the treatment plan，and finally the X-，Y- and Z- were obtained respectively.At the same time，TPS was used to calculate the dose value of D95，Dmean，CI，HI of the target and organs at risk (small intestine，bladder，rectum，colon，femoral head，pelvis，spinal cord，sigmoid colon) in the target area of the two groups of patients at the volume percentage contained in the isodose line.Results：The average errors in the X，Y，and Z directions of the supine and prone patients were ［(2.55±1.21） mm，（2.13±1.12） mm］，［(4.01±1.16） mm，（2.44±1.57） mm］，［(3.46±1.43） mm，（2.89±1.21） mm］，respectively.The average errors in the X，Y and Z directions of the prone position were smaller than those in the supine position，and both were statistically significant (P<0.05).There were no statistical differences in D95，Dmean，CI，and HI in the target area (P>0.05).Except for the femoral head，pelvis，spinal cord，and sigmoid colon，the doses of the small intestine，bladder，rectum，and colon in the prone position were significantly lower than those in the supine position，and both were statistically significance (P<0.05).Conclusion：In intensity-modulated radiotherapy for cervical cancer，prone position fixation can

significantly reduce the placement error compared with supine position,and better protection of organs at risk when the target area is consistent.

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备注/Memo: 江苏省重点研发计划（编号：BE2017679）

更新日期/Last Update: 2019-09-30