

# 头颈部肿瘤低剂量CT的临床应用进展

《现代肿瘤医学》[ISSN:1672-4992/CN:61-1415/R] 期数: 2019年04期 页码: 689-692 栏目: 综述 出版日期: 2019-01-08

**Title:** Research progress in the clinical application on head and neck tumour low-dose computerized tomography

**作者:** 胡启云; 董越

中国医科大学肿瘤医院 辽宁省肿瘤医院医学影像科, 辽宁 沈阳 110042

**Author(s):** Hu Qiyun; Dong Yue

Department of Radiology,Cancer Hospital of China Medical University,Liaoning Cancer Hospital and Institute,Liaoning Shenyang 110042,China.

**关键词:** 低剂量CT; 头颈部; 肿瘤; 临床应用; 辐射剂量

**Keywords:** low-dose CT; head and neck; tumour; clinical application; radiation dose

**分类号:** R739.91

**DOI:** 10.3969/j.issn.1672-4992.2019.04.038

**文献标识码:** A

**摘要:** 随着医疗技术的进步, 肿瘤等疾病发病率增加, CT临床应用越来越广泛, 随之带来的CT辐射对患者的损害日益显著。患者在CT扫描过程中受到的辐射损害日趋得到关注。头颈部是CT扫描最常用的部位之一, 低剂量CT在头颈部的应用越来越受到临床的重视, 本文就低剂量CT扫描技术在头颈部肿瘤疾病的临床应用进展作一综述。

**Abstract:** With the advancement of medical technology and increased incidence of oncological diseases, the clinical application of computed tomograph(CT) has become more and more extensive, and the damage of radiation is increasingly. The radiation damage suffered by the patient during the CT scan is getting more and more attention. The head and neck is one of the most commonly region used CT scans. The application of low-dose CT in the head and neck get more attention from the clinic. This is a review of the clinical application with low-dose CT scan technology in head and neck diseases.

## 参考文献/REFERENCES

- [1] Mettler FA,Bhargavan M,Faulkner K,et al.Radiologic and nuclear medicine studies in the United States and worldwide:Frequency,radiation dose, and comparison with other radiation sources-1950-2007 [J] .Radiology,2009,253(2):520-531.
- [2] Pearce MS,Salotti JA,Little MP,et al.Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours:a retrospective cohort study [J] .The Lancet,2012,380(9840):499-505.
- [3] Mathews JD,Forsythe AV,Brady Z,et al.Cancer risk in 680 000 people exposed to computed tomography scans in childhood or adolescence:Data linkage study of 11 million Australians [J] .BMJ,2013,346:f2360.
- [4] Francesca D,Graham B,Monika M,et al.Contribution of ATM and FOXE1 (TTF2) to risk of papillary thyroid carcinoma in Belarusian children exposed to radiation [J] .International Journal of Cancer,2014,134(7):1659-1668.
- [5] Yuan MK,Tsai DC,Chang SC,et al.The risk of cataract associated with repeated head and neck CT studies:a nationwide population-based study [J] .American Journal of Roentgenology,2013,201(3):626-630.
- [6] Liu S,Fu Q,Yu H,et al.Evaluate of the effect of low tube voltage on the radiation dosage using 640-slice coronary CT angiography [J] .Journal of X-ray Science and Technology,2018, 26(3):463-471.
- [7] Zhang W,Li M,Zhang B,et al.CT angiography of the head-and-neck vessels acquired with low tube voltage,low iodine, and iterative image reconstruction:Clinical evaluation of radiation dose and image quality [J] .Plos One,2013,8(12):e81486.
- [8] Albrecht MH,Nance JW,Schoepf UJ,et al.Diagnostic accuracy of low and high tube voltage coronary CT angiography using an X-ray tube potential-tailored contrast medium injection protocol [J] .European Radiology,2017,28(5):1-9.
- [9] Macía-Suárez D,Sánchez-Rodríguez E,Lopez-Calvino B,et al.Low-voltage chest CT:Another way to reduce the radiation dose in asbestos-exposed patients [J] .Clinical Radiology,2017,72(9):797.e1.
- [10] Bang M,Choi SH,Park J,et al.Radiation dose reduction in paranasal sinus CT:With feasibility of iterative reconstruction technique [J] .Otolaryngology,2016,155(6):982-987.
- [11] Li HO,Huo R,Wang XM,et al.High-pitch spiral CT with 3D reformation:An alternative choice for imaging vascular anomalies with affluent blood flow in the head and neck of infants and children [J] .British Journal of

- Radiology,2015,88(1052):20150005.
- [12] Bodelle B,Bauer RW,Holthaus L,et al.Dose and image quality of high-pitch dual source computed tomography for the evaluation of cervical lymph node status-Comparison to regular 128-slice single source computed tomography [J].European Journal of Radiology,2013,82(6):e281-e285.
- [13] Niesten JM,Schaaf ICVD,Vos PC,et al.Improving head and neck CTA with hybrid and model-based iterative reconstruction techniques [J].Clinical Radiology,2015,70(11):1252-1259.
- [14] Hussain FA,Mall N,Shamy AM,et al.A qualitative and quantitative analysis of radiation dose and image quality of computed tomography images using adaptive statistical iterative reconstruction [J].Journal of Applied Clinical Medical Physics,2016,17(3):419-432.
- [15] Kordolaimi SD,Argentos S,Mademli M,et al.Effect of iDose4 iterative reconstruction algorithm on image quality and radiation exposure in prospective and retrospective electrocardiographically gated coronary computed tomographic angiography [J].Journal of Computer Assisted Tomography,2014,38(6):956-962.
- [16] Hu XH,Ding XF,Wu RZ,et al.Radiation dose of nonenhanced chest CT can be reduced 40% by using iterative reconstruction in image space [J].Clin Radiol,2011,66:1023-1029.
- [17] Gervaise A,Osemont B,Lecocq S,et al.CT quality improvement using adaptive iterative dose reduction with wide -volume acquisition on 320 -detector CT [J].Eur Radiol,2012,22 (2):295-301.
- [18] Gaddikeri S,Andre JB,Benjert J,et al.Impact of model-based iterative reconstruction on image quality of contrast-enhanced neck CT [J].American Journal of Neuroradiology,2015,36(2):391-396.
- [19] Nagayama Y,Nakaura T,Tsuji A,et al.Radiation dose reduction using 100-kVp and a sinogram-affirmed iterative reconstruction algorithm in adolescent head CT:Impact on grey-white matter contrast and image noise [J].European Radiology,2017,27(7):2717-2725.
- [20] Corcuera-Solano I,Doshi AH,Noor A,et al.Repeated head CT in the neurosurgical intensive care unit:Feasibility of sinogram-affirmed iterative reconstruction-based ultra-low-dose CT for surveillance [J].American Journal of Neuroradiology,2014,35(7):1281-1287.
- [21] Sun J,Zhang Q,Duan X,et al.Application of a full model-based iterative reconstruction (MBIR) in 80 kVp ultra-low-dose paranasal sinus CT imaging of pediatric patients [J].La Radiologia Medica,2017,123(2):117-124.
- [22] Bang M,Choi SH,Park J,et al.Radiation dose reduction in paranasal sinus CT:With feasibility of iterative reconstruction technique [J].Otolaryngology,2016,155(6):982-987.
- [23] Vachha B,Brodoefel H,Wilcox C,et al.Radiation dose reduction in soft tissue neck CT using adaptive statistical iterative reconstruction (ASIR) [J].European Journal of Radiology,2013,82(12):2222-2226.
- [24] Jin GQ,Su DK,Xie D,et al.Distinguishing benign from malignant parotid gland tumours:low-dose multi-phasic CT protocol with 5-minute delay [J].European Radiology,2011,21(8):1692-1698.
- [25] Li L,Wang Y,Zhao Y,et al.Evaluation with low-dose dual-phase helical computed tomography of patients with thyroid lesions [J].Chinese Medical Journal,2013,127(22):3937-3943.
- [26] Liang JH,Zhu XJ,Yang KR,et al.Application of low radiation dose combined with low-dose contrast agent in thyroid CT enhanced scan [J].Chinese Medical Journal, 2017,25(2):105-108. [梁坚豪,朱新进,杨侃荣,等.低辐射剂量联合低剂量对比剂在甲状腺CT增强扫描中的应用 [J].中国医学影像学杂志,2017,25(2):105-108.]
- [27] Yu S,Zhang L,Zheng J,et al.A comparison of adaptive iterative dose reduction 3D and filtered back projection in craniocervical CT angiography [J].Clinical Radiology,2016,72(1):96.e1-96.e6.
- [28] Zhang WY,Zhao J,Zhou RC,et al Feasibility of double Low dose technology in multi-slice head and neck CT angiography without adaptive statistical iterative reconstruction [J].Chinese Journal of Medical Imaging,2015,23(11):829-832. [张文艳,赵静,周瑞臣,等.双低剂量在头颈部无迭代技术多层螺旋CT血管成像中的可行性 [J].中国医学影像学杂志,2015,23(11):829-832.]
- [29] Hoogeveen RC,Hazenoot B,Sanderink GCH,et al.The value of thyroid shielding in intraoral radiography [J].Dento Maxillo Facial Radiology,2016,45(5):20150407.
- [30] Fu Q,Lu T,Zhang L,et al.Radiation dose reduction at a price:The effectiveness of a thyroid shield during head CT scanning [J].Chinese Journal of Radiological Health,2008,17(1):13. [傅强,卢涛,张琳,等.头部CT扫描时防护围脖对减少甲状腺辐射剂量的评估 [J].中国辐射卫生,2008,17(1):13.]

---

**备注/Memo:** 辽宁省省直医院改革重点临床科室诊疗能力建设项目资助(编号: LNCCC-D43-2015)

---

更新日期/Last Update: 1900-01-01