Amy Chang

Honorary Clinical Assistant Professor, Department of Clinical Oncology, School of Clinical Medicine, HKUMed

Novel Radiation Techniques – Proton Beam, Carbon Ion, Adaptive Planning and Beyond

Radiotherapy has a pivotal role in the management of head and neck cancer, with curative radiation to primary tumor and pathological and high risk lymph node regions up to 6 to 7 weeks. Challenge exists in balancing tumor control and dose-limiting toxicities to the surrounding organs. Proton therapy is a novel radiotherapy technique that precisely delivers radiation to the tumor targets with the dosimetric advantages of Bragg Peak phenomenon, that is a sharp dose fall off at a specified tumor depth, eliminating exit dose with much improved sparing to neighboring normal tissues compared with conventional X-ray based radiotherapy. Proton therapy and other heavy ion beams such as carbon ion therapy, has a clear indication for head and neck cancers, especially for challenging sites such as tumors involving the skull base, when critical structures such as brainstem and optics are in close proximity, and dose escalation using heavy ion therapy is achievable without increasing toxicity to the nearby critical organs. Both proton and carbon ion therapy has been utilized in specialized centres with favorable treatment outcomes, and in the latter particularly for radioresistant malignant tumors. The current evidence in proton and carbon ion therapy, alone or in combination, will be reviewed. Local experience in Hong Kong Sanatorium & Hospital in terms of case series and clinical outcome, and the utilization of adaptive therapy to further enhance precision treatment, will be presented in this talk.

張天怡

香港大学李嘉诚医学院临床肿瘤科的荣誉临床助理教授

新型放射技术--质子束、碳离子、适应性规划及其他

放疗在头颈部癌症的治疗中起着举足轻重的作用，对原发肿瘤、病理淋巴结和高危淋巴结区域的根治性放疗疗程为 6 至 7 周。 如何在肿瘤控制和对周围器官的剂量毒性之间取得平衡是一项挑战。 质子疗法是一种新型放疗技术，它能将放射线精确送达肿瘤靶点，并具有布拉格峰现象的剂量学优势，即在指定的肿瘤深度处剂量急剧下降，与传统的 X 射线放疗相比，它能消除出口剂量，更好地保护邻近正常组织。 质子疗法和其他重离子束（如碳离子疗法）对于头颈部癌症有明确的适应症，特别是对于涉及颅底的肿瘤等具有挑战性的部位，因为这些部位邻近脑干和光学系统等重要结构，使用重离子疗法可以实现剂量升级，而不会增加对邻近重要器官的毒性。 质子和碳离子疗法都已在专业中心得到应用，并取得了良好的治疗效果，后者尤其适用于放射耐药性恶性肿瘤。 本讲座将回顾质子和碳离子疗法（单独或联合使用）的现有证据。 本讲座将介绍香港养和医院在病例系列和临床结果方面的本地经验，以及利用适应性疗法进一步提高精准治疗的情况。