Clinical trial of photodynamic therapy for peripheral-type lung cancers using a new laser device in a pilot study.

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Abstract

INTRODUCTION/AIM: Photodynamic therapy (PDT) involves the use of a tumor-specific photosensitizer and laser irradiation, and one of the treatment options recommended for early centrally located lung cancers, but not yet for peripheral-type lung cancers. We developed a new laser probe, the composite-type optical fiberscope (COF), which allows accurate laser irradiation of a cancer lesion with simultaneous visualization of the lesion. In this study, we attempted a new endobronchial PDT technique using the new laser probe, and evaluated the effectiveness and feasibility of this novel PDT technique for peripheral lung cancers.

METHODS: This phase I study was conducted in 7 patients with peripheral lung cancers (primary tumor ≤20 mm in diameter). We performed endobronchial PDT for these patients using the new laser probe and talaporfin sodium as the photosensitizer.

RESULTS: We performed PDT for 3 patients with peripheral lung cancer using a laser dose of 50 J/cm^2 at 120 mW, and confirmed the feasibility of using this dose. Then, we escalated the laser dose to 100 J/cm^2 in 4 additional patients. A total of 7 patients met our inclusion criteria. Evaluation at 2 weeks and 3 months after the PDT revealed no complication such as pneumonia or pneumothorax. At the evaluation conducted 6 months later, we found CR in 3 cases and SD in the remaining 4 cases.

CONCLUSION: PDT was found to be a feasible and non-invasive treatment modality for early peripheral-type lung cancer. In the future, PDT could become a standard treatment option for peripheral-type lung cancer.