Title: Follow-up using fluorescence bronchoscopy for the patients with photodynamic therapy treated early lung cancer

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Body: Purpose: To evaluate the accuracy of fluorescence bronchoscopy by precise histological analysis of the photodynamic therapy (PDT) treated lesions. Methods: A retrospective study was conducted on thirteen patients (16 lesions) with centrally located early lung cancer (CLELC) had been undergone photodynamic therapy and had been followed up by fluorescence bronchoscopy. Fluorescence bronchoscopy was performed between 1 and 60 months after photodynamic therapy. Results: Of the 16 early carcinomas treated, 14 (87.5%) had a CR, 2 (12.5%) had a NR after initial PDT. Among the 14 carcinomas achieving a CR, 4 (29%) recurred locally from 6 to 12 months after initial PDT. A total of 62 surveillance auto fluorescence bronchoscopies (average; 4.5/patient) and 47 biopsies (average; 4/patient) were performed after PDT. The addition of the SAFE-3000 examination to conventional bronchoscopy increased the sensitivity of screening from 69% to 100%, which yielded a relative sensitivity of 145% with a negative predictive value of 100%. Out of 14 CR lesions, 9 lesions finally reverted to normal fluorescence. CR cases that did not show normal fluorescence were relapsed cases or a patient with complete response whose treated lesion showed fibrosis in the sub mucosa. Histopathological finding of the complete response sites which demonstrated temporal fluorescent defect consisted of inflammatory lesions, goblet cell hyperplasia, basal cell hyperplasia, squamous metaplasia or dysplasia. Conclusion: our results confirm that SAFE-3000 allows accurate assessment of the quality and efficacy of PDT.