NBIを組み合わせた拡大気管支ビデオスコープによる
Angiogenic Squamous Dysplasia (ASD)の観察

要約 — 目的. 気管支 squamous dysplasia の内視鏡による詳細な観察を目的に、狭帯域フィルターを用いた Narrow Band Imaging (NBI)を組み合わせた拡大気管支ビデオスコープ (HMB)による気管支粘膜の微細血管の観察を行った。対象と方法. 喫痰細胞診を指し、48症例に対して、気管支ビデオスコープ (BF240)によ る気管支粘膜観察の後、蛍光気管支内視鏡 (LIFE-Lung System)を施行した。正常蛍光部位および異常蛍光部位に対して、通常の光源を用いてHMBによる気管支の微細観察を行った後、光源をNBIに切り換え同一部位の観察を行った。 更に生検を施行しHMB画 視所見、NBI画像所見と病理組織学的所見とを比較検討した。NBI観察時には、面積次式電子スコープシステムの光源装置フィルターを、Blue1 (青): 400〜430 nm, Blue2 (青): 420〜470 nm, Green (緑): 560〜590 nmの波長帯域を持つ狭帯域フィルターに変更、使用した。結果. 気管支 squamous dysplasiaにおいて、NBI-Blue1画像では詳細な微細血管、微細血管網および点状の血管の観察が可能であった。NBI-Blue1画像でとらえられた点状の血管は、形態計測の結果ASDにおけるcapillary loopの径と一致した。3. NBI-Blue1画像で点状の血管を確認した異常蛍光18部位中17部位は、組織学的に dysplasiaであり、angiogenic squamous dysplasia (ASD)も14部位で確認され、点状血管の有無とangiogenic squamous dysplasiaの有無には推計学的有意差を認めた (P=0.002)。結論. 気管支粘膜の微細な血管を観察するためには、ヘモグロビンに吸光度が高く400〜430 nmの狭帯域波長の青色光を用いたNBI-Blue1画像が有効であり、in vivoにおいて、angiogenic squamous dysplasiaの抽出が可能になった。(気管支学会, 2002;24:623-625)

索引用語 — Narrow band imaging, 拡大気管支ビデオスコープ, Angiogenic squamous dysplasia

Detection of Angiogenic Squamous Dysplasia Using High Magnification Bronchovideoscopy Combined With Narrow Band Imaging

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ABSTRACT — Purpose. The purpose of this study was to investigate the value of high magnification bronchovideoscopy (HMB) combined with narrow band imaging (NBI) in detailed examination of angiogenic squamous dysplasia (ASD) in the bronchial vascular patterns of patients exhibiting abnormal mucosal fluorescence. Materials and Methods. We have developed a method of HMB combined with NBI that enabled improved observation of vascular patterns of the bronchial mucosa. A total of 48 patients with sputum cytology suspicious or positive for malignancy were entered into the study. First, conventional white light and fluorescence bronchoscopic examination, then high-magnification observation were performed by HMB primarily at sites of normal and abnormal fluorescence to examine the microvascu-
lar network in the bronchial mucosa. Lastly, HMB combined with NBI was performed and detailed magnifying observation was done. We changed the spectral feature from conventional RGB broadband filter to the new NBI filter on the RGB sequential videoscope system. The range of wavelength in the new NBI filter were B1: 400-430nm, B2: 420-470nm, G: 560-590nm, respectively. Results. 1. In squamous dysplasias, the micro-vessel, the vascular network with various grade and the dotted vessel in details were most clearly observed in the NBI-B1 image. 2. The diameters of dotted vessel observed in the NBI-B1 image were in accord with those of the capillary blood vessels in ASD diagnosed pathological examination. 3. Correlation between the frequency of the dotted vessels by NBI and those of pathologically confirmed ASD was significant (p = 0.0020). Conclusion. Our results showed that the NBI system would be useful in the detection of the capillary blood vessels in ASD especially in the NBI-B1 image. (JJSB. 2002;24:623-625)

KEY WORDS — Narrow band imaging, High magnification bronchovideoscopy, Angiogenic squamous dysplasia

INTRODUCTION

We developed a direct viewing high magnification bronchovideoscopy system with the aim of making detailed observations of bronchial mucosa.\(^1\,^2\) Recently, a new morphological entity, angiogenic squamous dysplasia, was identified in large airways by fluorescence bronchoscopy, where collections of capillary blood vessels were closely juxtaposed to, and projected into, dysplastic bronchial epithelium.\(^3\,^4\) The purpose of this study was to investigate the value of high magnification bronchovideoscopy combined with Narrow Band Imaging (NBI) in detailed examination of angiogenic squamous dysplasia (ASD) in the bronchial vascular patterns with abnormal mucosal fluorescence.

MATERIALS AND METHODS

Narrow Band Imaging

Narrow Band Imaging (NBI) developed in conjunction with the Olympus Optical Corp., Tokyo, Japan, is novel

![Conventional and Narrow Band Imaging](image)

Figure 1. Narrow Band Imaging は、面積欠損検査方式で用いられている RGB の光学フィルタの帯域を制限することにより、組織表面の微細な構造をコントラスト良く画像化することができる。

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RESULTS

Magnified Observation of Bronchial Mucosa by High magnification Bronchovideoscopy Combined With NBI

In squamous dysplasias, the micro-vessel, the vascular network with various grades and the dotted vessels in details were most clearly observed in the NBI-B1 image.

Comparison Between Vessels Observed as Dots Using High-magnification Bronchovideoscope and Capillary-sized Blood Vessels Projecting Into Dysplastic Epithelium Microscopically (ASD)

The diameters of dotted vessel observed in the NBI-B1 image were in accord with those of the capillary blood vessels in ASD diagnosed pathological examination.

Correlation Between the Frequency of the Dotted Vessels by NBI-B1 Image at Sites of Abnormal Fluorescence Established by Fluorescence Bronchoscopy and Those of Pathologically Confirmed ASD

Correlation between the frequency of the dotted vessels by NBI-B1 image and those of pathologically confirmed ASD was significant.

CONCLUSION

In conclusion, our results showed that the NBI system would be useful in the detection of the capillary blood vessels in ASD especially in the NBI-B1 image.

REFERENCES