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## CASE REPORT

# Endobronchial application of Ankaferd blood stopper to control profuse lung bleeding leading to hypoxemia and hemodynamic instability

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Received 12 September 2008; accepted 16 October 2008

## KEYWORDS

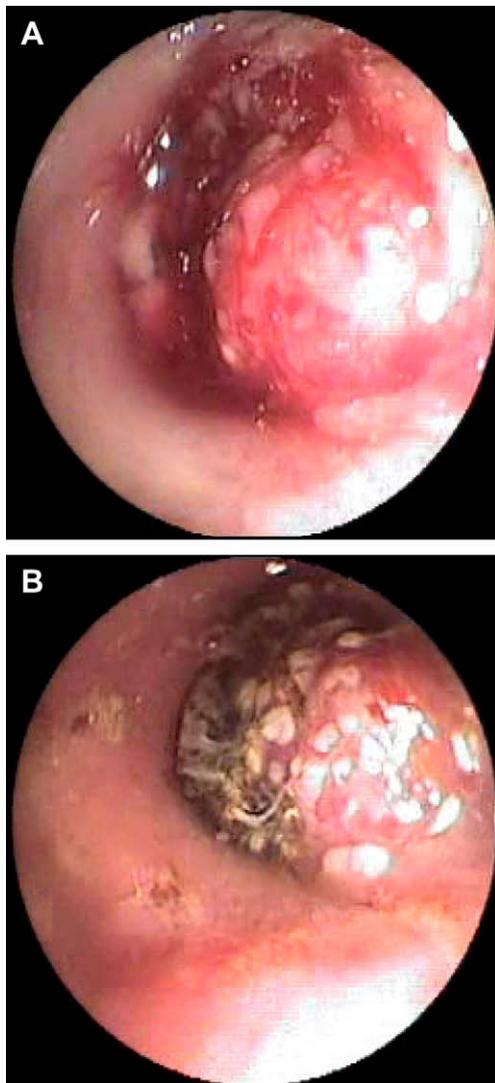
Bleeding;  
Lung cancer;  
Ankaferd blood  
stopper<sup>®</sup>

Profuse lung bleeding caused by tumoral infiltration, a sudden clinically challenging emergent state, can cause life-threatening hypoxemia and hemodynamic instability.<sup>1</sup> Ankaferd blood stopper (ABS) is a unique standardized medicinal plant extract, which has been approved in the management of post-surgery external bleeding and dental surgery in Turkey.<sup>2</sup> ABS induces a very rapid formation (less than 1 s) of a specific hemostatic protein network within vital erythroid aggregation in the injured vascular area.<sup>2</sup> Data on the efficacy of ABS for the management of bleedings of difficult clinical states are limited to case reports only.<sup>3–5</sup> We, herein, present a non-small cell lung cancer patient presenting with severe hemoptysis leading to hypoxemia and hemodynamic instability, which had successfully been controlled via the endoscopic application of ABS.

A 62-year-old man was admitted into the emergency room because of severe hemoptysis, hypoxemia, anemia and hemodynamic instability. Emergent fiberoptic bronchoscopy revealed that the right intermediate bronchus orifice was almost completely occluded by an actively bleeding endobronchial neoplastic lesion (Fig. 1A). Subsequent tissue biopsies were taken from the lesion and 2 ml of ABS was administered topically to the bleeding mass because of the emergent life-threatening state, and hemostasis was achieved within seconds (Fig. 1B). No sign of bleeding was observed in the following days. The patient was hemodynamically stabilized. Histopathological appearance of the tissues after Ankaferd application is correlated to reveal that ABS does result in the formation of unique erythroid-rich aggregates within the eosinophilic protein network (Figs. 2 and 3). Furthermore, poor-differentiated squamous cell carcinoma cells were trapped within the ABS-induced hemostatic network (Fig. 4).

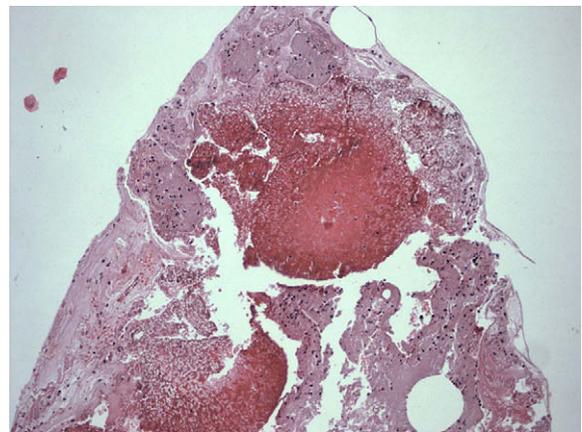
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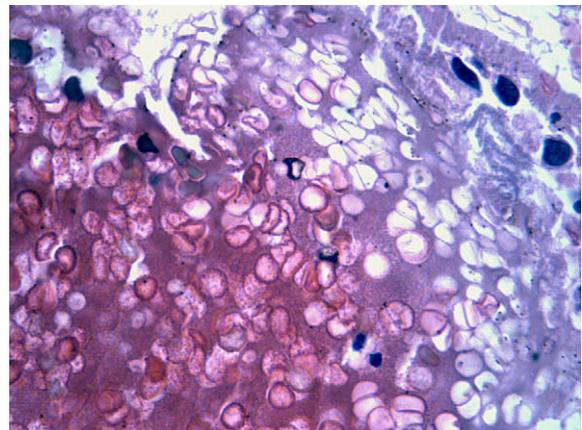


**Figure 1** Fiberoptic bronchoscopy revealed that the right intermediate bronchus orifice was almost completely occluded by a bleeding neoplastic endobronchial lesion (A). Subsequent tissue biopsies were taken from the lesion and 2 ml of ABS was administered topically to the bleeding mass, and hemostasis was achieved within seconds (B).

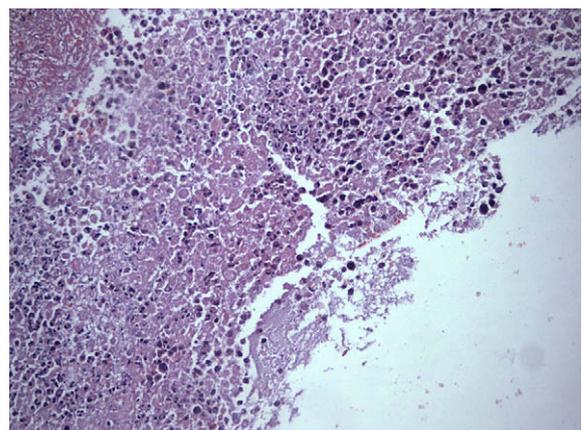
Lung bleedings may represent a real diagnostic and therapeutic challenge as in our patient. Effective management of the bleeding problem is particularly required in patients with hereditary and acquired hemorrhagic diathesis including neoplasia and the use of anticoagulant, antihemostatic drugs.<sup>6</sup> ABS, a standardized mixture of five plants, provides immediate hemostasis. A study showed that its effect is not dependent on individual coagulation factors and platelets.<sup>2</sup> Its hemostatic success in primary and secondary hemostatic defects has been supported with *in vivo* and *in vitro* observations.<sup>2-5</sup> Neither any local adverse effect nor systemic toxicity was observed following the bronchoscopic application of ABS. Therefore, physiological cell-based coagulation could be clinically managed via topical Ankaferd application to prevent and treat bleeding in many distinct clinicopathological states.



**Figure 2** Erythroid aggregates within the fibrinoid material and eosinophilic mass protein network induced by Ankaferd blood stopper (H + E  $\times$  40).



**Figure 3** Eosinophilic mass protein network covering groups of induced erythroid aggregates by Ankaferd blood stopper (H + E  $\times$  1000).



**Figure 4** Poor-differentiated squamous cell carcinoma cells trapped within the Ankaferd-induced hemostatic network (H + E  $\times$  200).

Since there is a close correlation between tumor growth and hemostasis of cancer,<sup>7,8</sup> the effect of ABS among other hemostatic agents<sup>9</sup> should also be further searched. Controlled clinical studies should be performed regarding the efficacy of ABS in the controlling of emergency bleedings.

### Conflict of interest statement

None of the authors have a conflict of interest to declare in relation to this work.

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