Three-dimensional printing-assisted interventional therapy for thoracogastric right main bronchial fistula

A 48-year-old man with a thoracogastric right main bronchus fistula after radical resection of esophageal carcinoma underwent esophageal stent placement. However, the stent needed to be removed due to stent migration. Considering the insufficient conformity of the stent on the digestive side of the patient and the large number of durable complications associated with tracheal stent implantation [2, 3], it was decided to seal the fistula with an occluder [4]. The right main bronchus and residual stomach were abnormally communicative after the stent removal (Fig. 1). To assist with the selection of the occluder model and guide the operation, we constructed an in vitro 3D model of the patient’s thoracogastric airway fistula (Fig. 2, Video 1). Subsequent reexamination confirmed that the occluder had been positioned satisfactorily (Fig. 3).

The patient presented with symptoms of fever, cough, and sputum recurrence 10 months post-surgery, leading to the suspicion that the occluder had become dislodged. A digital radiography examination revealed that the occluder had fallen off into the colon and was discharged through the anus (Fig. 4). Bronchoscopy found that a fistula with a diameter of about 2 cm was visible at the proximal right bronchus inferior carina. 3D printing was performed again for fistula condition. The stent type was selected based on the 3D printed model and simulated in vitro occlusion. A double Y-stent was placed to avoid the risk of occluder migration (Fig. 5). Up to 9 months after the procedure (Video 1), the patient had no related symptoms. The imaging results indicated that the patient’s stent fit was satisfactory. Based on 3D printing, more accurate treatment options are provided for in vitro evaluation of fistula size and location and selection of occluders and stents with appropriate diameters.

Based on 3D printed models, the size, location, and morphology of thoracogastric airway fistulas can be more accurately assessed, which can help physicians better determine the size and location of stents or occluders [1].
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Conflict of Interest

The authors declare that they have no conflict of interest.

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References


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Bibliography

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