Tohoku Univ. Technology

# Traction system for Endoscope treatment

## Safe surgical resection of lesions with a traction robot

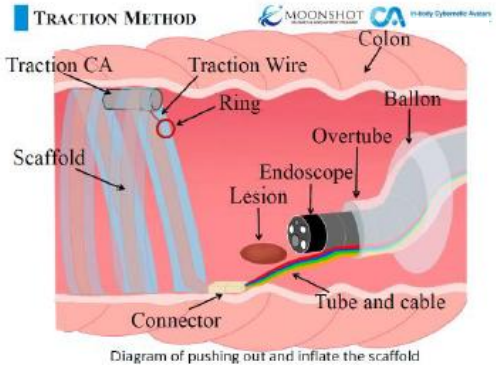


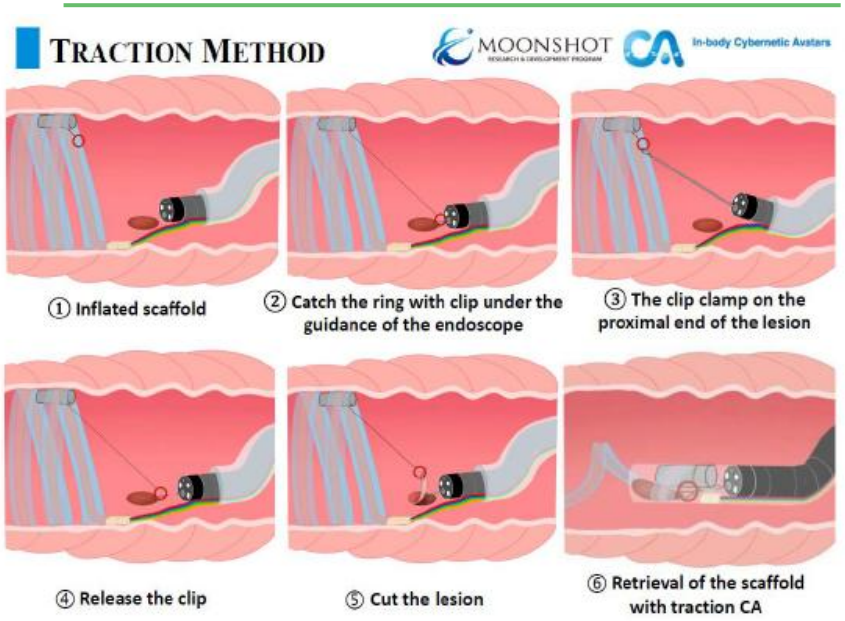
Diagram of pushing out and inflate the scaffold

## Overview

Endoscopic submucosal dissection (ESD) is a technique that enables en bloc resection of lesions, but it is highly difficult to operate. In particular, highly skilled techniques are required in cases where the field of view is narrow or it is not possible to smoothly crawl into the submucosa. Conventionally, there has been a technique that secures the field of view of the peeling surface and reduces the crawling operation by pinching the lesion with a clip or the like connected to an elastic member and pulling it. However, it is not easy to properly attach a grasping member through an endoscope, and there is a problem that complicated work is required to operate multiple treatment tools.

The present invention relates to a traction robot that safely and reliably performs a resection procedure by pulling a lesion with an appropriate force. An electromagnetic motor and a wire for pulling the lesion are provided inside the traction robot, and a force sensor is mounted **to measure the traction force and enable feedback control**. In addition, the traction force can be detected more safely and with high accuracy by providing a scaffold for fixing the traction part in vivo.

## Features・Outstandings




## Product Application

- Endoscopic Submucosal Dissection (ESD)

## Related Works

[1] X. Gao, N. Tsuruoka, W. Liu, Y. Sakaguchi, Y. Tsuji, M. Fujishiro, F. Arai, and Y. Haga, Sensors and Materials, Vol. 38, No. 1, (2026), pp.71-88

## IP Data

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