

Pneumatic method of extraction of retained videocapsule



Annotation

Method ensures extraction of retained intestinal videocapsule, but could also be used for its intraction.

Videocapsule is a cylinder with rounded ends and dimensions about 11x24 mm. Assertions that peristalsis ensured non-problem intestinal endoscopy is nothing more than advertisement. The first problem of capsule endoscopy is swallowing of capsule, the second – insufficient battery resource in connection with long-term capsule location in stomach and duodenum, the third – threat of capsule retaining in pathologically narrowed segment of intestine. The incidence of retention reaches 13% [\[1, 2\]](#).

These problems are trying to eliminate by flexible endoscope and mechanical instrument for removal of foreign bodies. Instrument is represented by traditional Bowden-traction unit, where on the distal is located fixator of body in shape of basket, capture or scoop-net, but on the proximal end – manual traction drive.

Technology which uses, the instrument with basket, supposes the following consecutive manipulations:

1. Approaching of endoscope's end toward the foreign body.
2. Insertion of instrument into endoscope's channel and then into intestinal cavity.

3. Introducing of basket under the foreign body.
4. Fixation of foreign body.
5. Extraction of endoscope together with foreign body outwards.

The rounded form, smooth and solid surface, absence of lateral access hamper the mechanical fixation and extraction of retained capsule. Numerous attempts to introduce basket under the capsule, traumatizes intestine, threatens by perforation; growth of gas bubble which could be seen over capsula during roentgenoscopy, will testify about progressing intestinal obstruction which requires, as is known, operation including laparotomy, enterotomy, capsule extraction, making of intestinal sutures.

Focus of pneumatic method – usage of negative pressure, which is feeded in the cavity between endoscope's tip and visible capsule's pole. Cavity is formed by elastic cuff located on the end of endoscope. Practical implementation of the method showed that most acceptable become removable silicone cuff. Its reliable connection is ensured by bandage ring, putting on the proximal part of silicone cuff from the side of endoscope. Taking into account the maximum of negative pressure and diameter of distal end of endoscope, the force fixing capsule to endoscope, could reach 1 kgf (about 10 N).

Method is patented [3].

Basic sources of information

1. <http://ncbi.nlm.nih.gov/pmc/articles/PMC2850858> Small Bowel Obstruction from Capsule Endoscopy. M.Boysen, M. Ritter. Western Journal of Emergency Medicine. Vol.XI, No.1. February 2010.
2. http://www.cuh.org.uk/cms/sites/default/files/publications/PIN1123_retained_capsule.pdf Video capsule endoscopy: retained capsule. Cambridge University Hospitals NHS Foundation Trust. 2008.
3. Матасов С.А. Способ экстракции вклиненной кишечной видеокапсулы и устройства для его осуществления. Патентная заявка Латвии № Р-12-44. 20.11.2011.
4. <http://www.vhjo.org/index.php/vhjo/article/view/20/19> Capsule Retention: It's not all bad! P.Manchalapati, D.R.Cave, Visible Human Journal of Endoscopy, Vol.9, Iss.2, 2010.
5. <http://www.ncbi.nlm.nih.gov/pubmed/21811157> Outcomes after symptomatic capsule retention in suspected small bowel obstruction. A.M.Singear, EU Journal of Gastroenterology and Hepatology, Vol.23, Iss.10, 2011
6. <http://www.ncbi.nlm.nih.gov/pubmed/19830002> Acute small bowel perforation after wireless capsule endoscopy in a patient with Crohn's disease: a case report. D.A.Parikh et al., Cases Journal, 2009
7. <http://www.hindawi.com/journals/grp/2012/518718> C.M.Hoog et al., Capsule Retentions and Incomplete Capsule Endoscopy Examinations: An Analysis of 2300 Examinations. Gastroenterology Research and Practice, Vol.2012