

# Novel Endoscopic Repair Technique for gastrointestinal Leaks and Perforations using Negative Pressure Therapy with Open-pore Polyurethane-foam and Film Drainages

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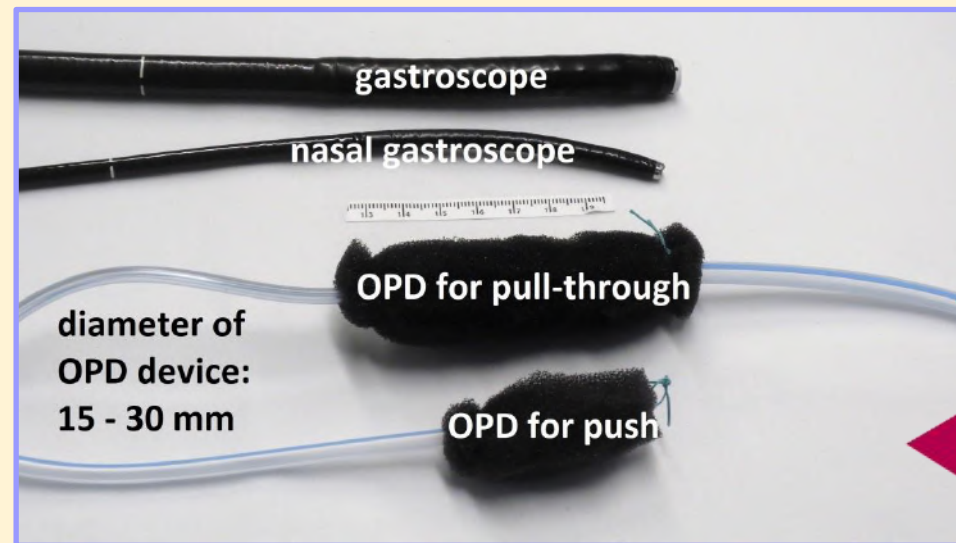


## Background

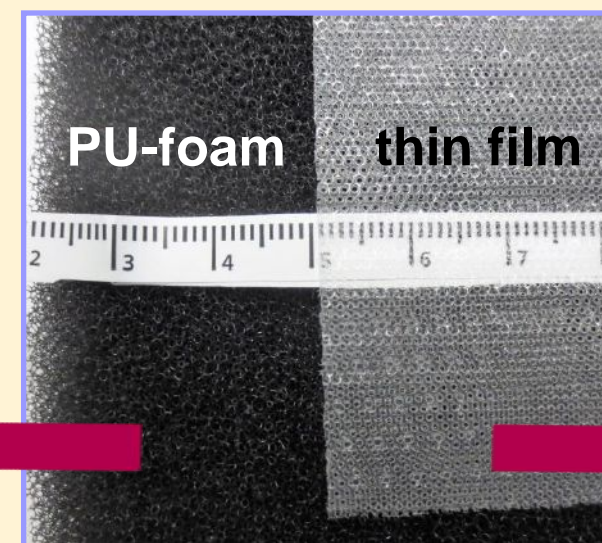
Endoscopic Negative Pressure Therapy (ENPT) has been developed to treat gastrointestinal defects. It has been referred for rectum and esophageal leakages in several studies. We adapted ENPT to treat duodenal defects. We report ENPT in a series of 10 patients with duodenal leakages.

**Material:** The tip of a drainage tube is wrapped with open-pore Polyurethane (PU)-foam or a very thin open-pore film.

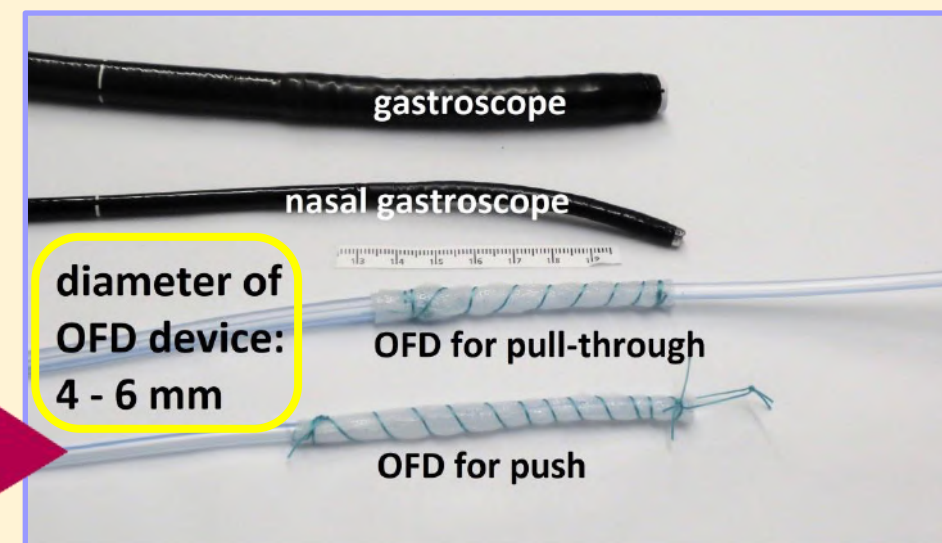
### PU-foam drainage (OPD)



### open-pore



### new small-bore film drainage (OFD)

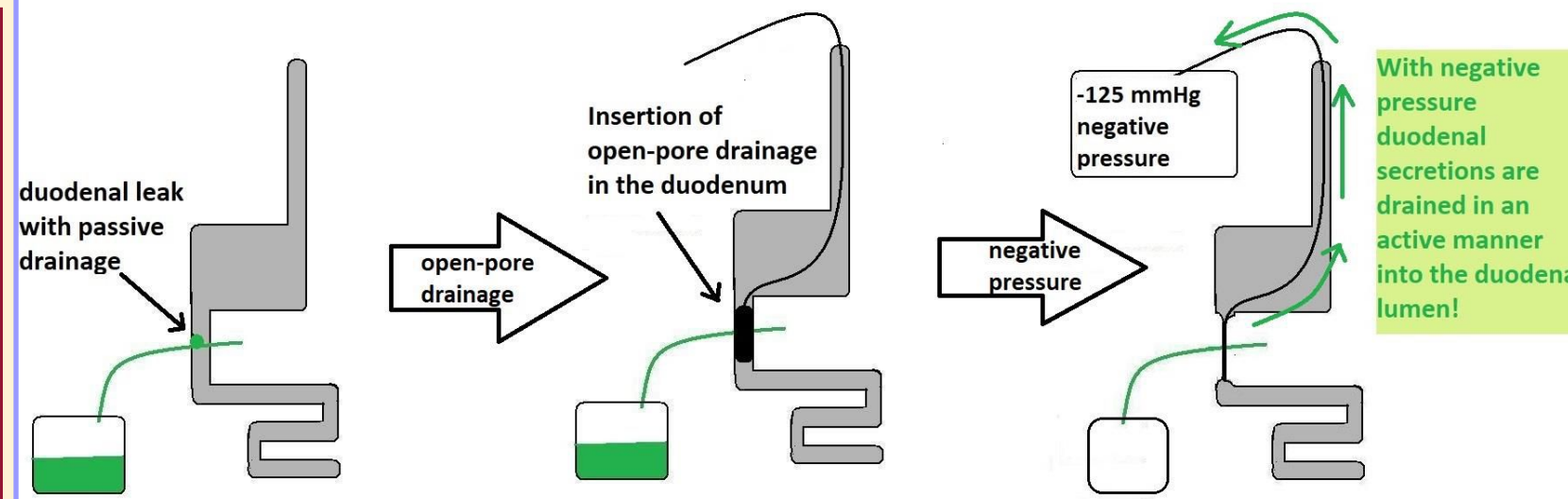


Advantage of the OFD device is its small diameter. Placing manoeuvre is the same as for gastro-duodenal tubes. OFD and OPD are inserted into the duodenal lumen (intraluminal ENPT) or through a defect in the extraluminal cavity (intracavitary ENPT) using common endoscopic methods (push, pull-through).

Material of film: Double layered open-pore film (Suprasorb @ CNP, Drainage Film, Lohmann&Rauscher): The open-pore film consists out of two permeable membranes with a small interspace. Fluids are drained along the interspace and through the membranes.

**Method:** Application of negative pressure results in closure of the defect and active drainage of duodenal secretions.

**Principle of the repair technique:** After the open-pore drainage device has been placed in the duodenum with endoscopy, vacuum is applied. Negative pressure results in collapse of the duodenal lumen, closure of the defect and active drainage of duodenal secretions, simultaneously.



Endoscopic Negative Pressure Therapy with open-pore PU-foam and double layered film devices allows an **active drainage of fluids**.

- Liquid secretions are drained:**
- against force of gravity
  - along negative pressure gradient
  - directed to the intestinal lumen

## Results

**All leakages of duodenum were closed with ENPT after a treatment period of 11 days in median (range 7-19 days).**

Patient	Reason to treat	Material	Variant of ENPT	Endoscopic technique	Duration (d) of ENPT	Change drainage	Success of defect closure
10 pat	8x suture rupture	7x OPD	9x intraluminal	7x push 1x push and pull-through	m=11 (7-19)	0-3 x	10*/10
3m, 7f	1x iatrogenic perforation ERCP	1x OFD	1x intracavitary	1x pull-through			*2 pat died, one 1 week, the other 1 month after ENPT for other reasons, leaks were closed.
43-80 yo	1x perforation of operative drainage	2x OPD/ OFD		1x intraoperative rendezvous			

**Conclusion:** Endoscopic Negative Pressure Therapy is a new promising method to treat duodenal leakages.