USE OF A SELF-EXPANDABLE METAL STENT FOR ENDOSCOPIC-GUIDED DRAINAGE OF A PANCREATIC PSEUDOCYST IN AN ELDERLY FILIPINO WOMAN

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ABSTRACT

The management of pancreatic fluid collection which develops after acute pancreatitis has evolved greatly in recent times from traditional standard surgical approach. The recent trend in the management of symptomatic pancreatic pseudocysts (PPC) has been toward less invasive approaches. In gastroenterology, the current most common approach is through endoscopic ultrasound (EUS) guidance with the use of double plastic pigtail stents or a self-expandable metal stent (SEMS). The use of single SEMS has been reported in several case reports and small case series. However, to our knowledge, this has not been described in literature in the Philippines as of this writing. This novice approach will have significant implications in the management of PCC with a lower morbidity and mortality.

Herein, we describe a case of an elderly Filipino woman presenting with a large PCC associated with early satiety and bloating four weeks after initially presenting with severe acute pancreatitis. EUS-guided cystogastrostomy using a "NAGI"-covered SEMS was done, followed after a month by replacement with two plastic pigtail stents, causing disappearance of the PCC and significant resolution of patient's symptoms. Trans-mural approach using SEMS for drainage of PPC is becoming more prominent due to the increased accuracy afforded by real-time high-resolution imaging and lower procedure duration and resolution time.

Keywords: #Pancreatic pseudocysts #Endoscopic Ultrasound #Self expandable metal stent

INTRODUCTION

A pancreatic pseudocyst (PPC) is defined as a collection of fluid in the peripancreatic or intra-pancreatic tissues, surrounded by a well-defined wall and contains essentially no solid material *(1)*. PPCs are usually complications of both acute and chronic pancreatitis, pancreatic trauma, and pancreatic duct obstruction. Most PPCs regress spontaneously and require no treatment, whereas some may persist and progress until complications occur (*2).*

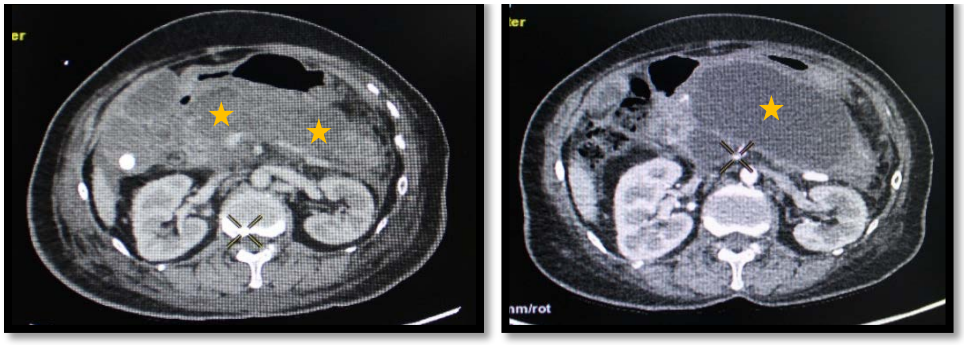
PPCs can be treated with a variety of methods; to wit: percutaneous catheter drainage, endoscopic transpapillary or transmural drainage, laparoscopic surgery, or open pseudocystoenterostomy *(3).* Traditionally, surgical approach was the treatment of choice for symptomatic PPCs. Although surgery is effective, complications can occur in up to 35% of patients, and death from surgery has also been noted *(4.)* The recent trend in the management of symptomatic PPC has been toward less invasive approaches such as endoscopic drainage, including cystgastrostomy *(5-6).* This is suitable because most PPCs lie adjacent to the stomach. The major advantage of the endoscopic approach is that it creates a permanent pseudocysto-gastric track with no spillage of pancreatic enzymes *(7.)*

Standard procedure for endoscopic ultrasound-guided drainage of PPC includes the use of various plastic pigtail stents in the same endoscopic procedure and the need for programmed replacement to preclude their dysfunction. The use of completely covered self-expanding metallic stents (SEMS) has recently been shown to be a safe and effective alternative that reduces the number of procedures and brings about more rapid cyst resolution, with lesser complication *(8).*

CASE REPORT

A 71-year-old female initially presented with severe acute pancreatitis, with pleural effusion on chest radiograph and peripancreatic fluid collection with 23 hounsefield unit on computed tomography (CT) scan of whole abdomen, suggestive of hemorrhagic pancreatitis *(Fig 1A)*. Patient was discharged stable with resolution of symptoms after seven days of hospital admission.

Four weeks later, she started to complain of early satiety, bloating and recurrence of abdominal pain. A follow up CT scan of the upper abdomen revealed a well circumscribed fluid attenuating structure within the pancreas, that measures approximately 249 cc, representing a pseudocyst formation *(Figure 1B).*



FIGURES 1 A-B. CT scan of Abdomen (Axial views):

A) Diffusely swollen pancreas with areas of hypodensities (23 HU) indicated by stars; peripancreatic fluid and fat strandings noted

B) Well circumscribed fluid-attenuating structure within the pancreas, that measures approximately 249 cc, representing pseudocyst formation indicated by star

Due to symptom persistence, the patient underwent endoscopic ultrasound (EUS)-guided cystogastrostomy with the placement of a 3 cm long "NAGI"-covered Self expandable metal stent (SEMS) (Taewoong-Medical Co, Seoul, South Korea) with a 10 mm diameter *(Figure 2).*

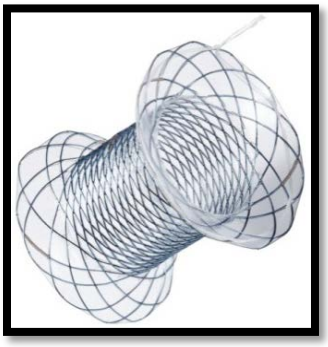
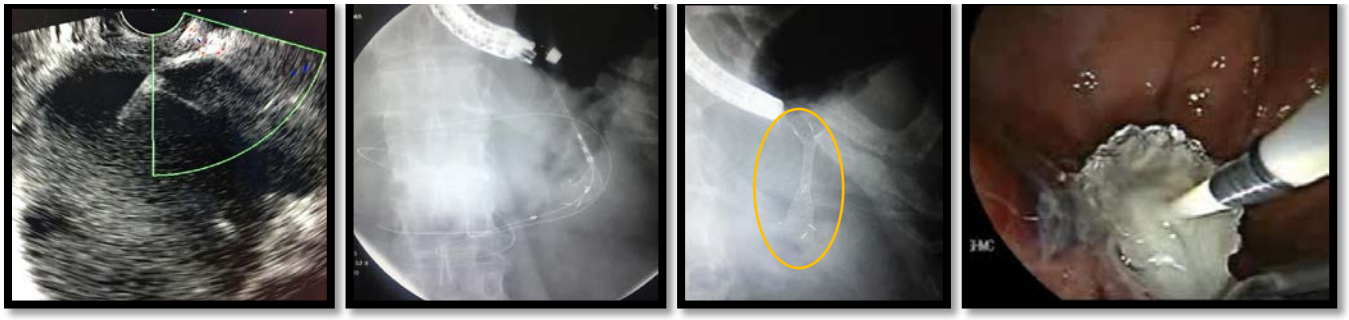


FIGURE 2. NAGI™ Stent | Taewoong Medical Taewoong Medical NAGI™ Stent

Endoscopic ultrasound– guided pseudocyst drainage

The echoendoscope was advanced to the stomach where a large cystic lesion measuring > 5 cm was seen at the pancreatic body. Under endosonographic vision with use of doppler mode, the area between the pancreatic pseudocyst (PCC) and gastric wall was assessed for vessels which showed to be absent in a certain window, and the location most suitable for puncture was selected. A 19G-caliber Echotip® needle (Cook Endoscopy) was punctured into the PCC followed by aspiration of cyst fluid for culture, sensitivity and cytology *(Fig 3A).* A guidewire was advanced over the needle and coiled-up inside the PCC, then the tract was dilated with a cystotome *(Fig 3B).* This was followed by the deployment of the stent in radiographic view *(Figure 3C).* In endoscopic view the NAGI SEMS was inserted into the posterior portion of the stomach, creating the cystogastrostomy where a purulent pancreatic cystic fluid flowed from the stent orifice *(Figure 3D).*



FIGURES 3 A-D

3A) Endosonographic view: area between cyst and gastric wall assessed for absence of vessels; 19G-caliber Echotip® needle (Cook) was punctured into the cyst.

3B) Radiographic view: A guidewire was advanced over the needle and coiled-up inside the pseudocyst followed by tract dilatation with cystotome.

3C) Radiographic view: "NAGI" Covered Self Expandable Metal Stent (CSEMS) (encircled), deployed.

3D) Endoscopic view: Purulent pancreatic cystic fluid flowed from the stent orifice.

A scout film of the abdomen in upright position was done right after the procedure, which showed the stent in the projection of the stomach with an ovoid calcific density also seen in the right upper quadrant *(Figure 4).* The pseudocyst aspirate culturev eventually revealed Candida species and patient was started with Fluconazole. The patient was then discharged stable.

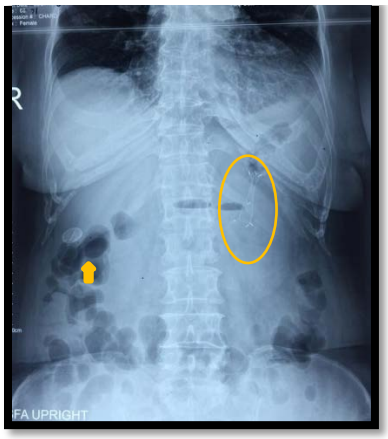


FIGURE 4. Scout film of the abdomen in upright position: Stent is seen in the projection of the stomach (encircled), with an ovoid calcific density also seen in the right upper quadrant indicated by arrowhead.

Inorder to evaluate the medium-term results of the drainage procedure, a follow-up CT scan of the upper abdomen was done two weeks thereafter and four weeks thereafter after insertion of the SEMS which showed interval decrease in the size of the PCC, measuring 44 cc and 22 cc, respectively *(Figure 5A-C).*

FIGURES 5 A-C: Follow up CT Scan of Upper Abdomen after insertion of "NAGI" Covered Self Expandable Metal Stent (SEMS)

2 weeks after

5A) Axial view: Interval decrease in the size of pseudocyst within the pancreas now measuring 44 cc (previously 249 cc) 5

5B) Saggital view: Metallic stent seen connecting the cyst to the stomach

4 weeks after

5C) Further decrease in size of the pancreatic pseuodocyst, now with approximate volume of 22 cc. (previously 44 cc)

Removal of SEMS and replacement with double plastic pigtail stents

Due to incomplete drainage of the pseudocyst one month after the insertion of the SEMS, gastroscopy with fluroscopy guidance was done to remove the metal stent and to replace it with two plastic pigtail stents *(Fig 6 A-C).*

FIGURE 6 A-C. Replacement of CSEMS with two plastic pigtail stents

A) Endoscopic view: Removal of the previously inserted CSEMS using a snare

B) Endoscopic view: Two Double pigtail stents now seen at the previous site of CSEMS at the posterior gastric wall

B) Radiographic view: Two plastic pigtail stents at the projection of the stomach

One month after the insertion of the two plastic pigtail stents, repeat CT scan of the upper abdomen showed interval disappearance of the pancreatic pseudocyst, with the pancreas now normal in size. Radiopaque catheters were likewise noted connecting the pancreas to the stomach *(Fig 7A –B).*

An EGD was then done to remove the previously inserted plastic pigtail stents using a rat-tooth forceps.

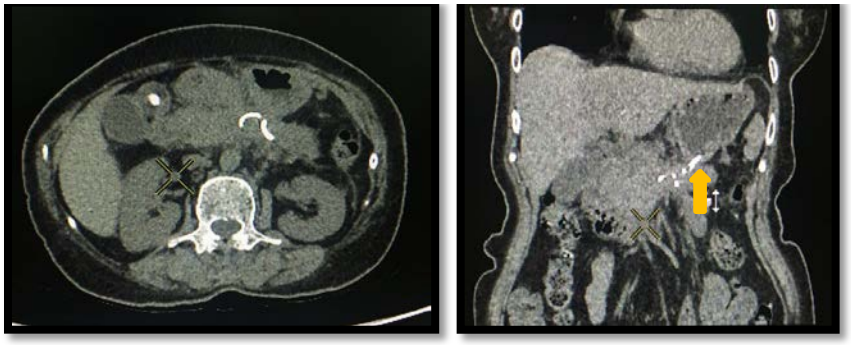


FIGURE 7 A-B. Follow up CT scan of Upper Abdomen 1 month after insertion of pigtail stents

7A) Axial View: Interval disappearance of the pancreatic pseudocyst. Pancreas is now normal in size.

7B) Saggital View: Radiopaque catheters, indicated by star, connecting the pancreas to the stomach.

The patient claimed significant relief with no recurrence of abdominal pain, early satiety & bloating, with very good appetite. At interval of one month outpatient evaluation, the patient remained asymptomatic.

DISCUSSION

Endoscopic drainage provides minimal invasive access to the PPC, which may be performed by a trans-papillary or a trans-mural approach. Trans-mural endoscopic drainage is indicated for PCC that do not communicate with the main pancreatic duct and that are compressed against the digestive tract *(9.)* Drainage of the cyst fluid by the trans-mural approach is achieved *via* the insertion of a stent between the pseudocyst and the gastric lumen (cystogastrostomy) or between the pseudocyst and the duodenal lumen (cystoduodenostomy).

EUS-guided cystogastrostomy is suitable because most PPCs lie adjacent to the stomach; however, both endoscopic and radiologic skills are required. The aim is to create a connection between the PPC cavity and the gastrointestinal lumen *(10-11).* After needle puncture and aspiration of the pseudocyst content (for biochemical and cytological analyses), a guidewire should be inserted, along which an incision can be made with either a diathermic coagulation probe or a needle-knife papillotome. Once access has been achieved, a double pigtail catheter can be introduced into the cyst over the wire. The European Society of Gastrointestinal Endoscopy (ESGE) recommends the insertion of at least two double-pigtail plastic stents (*12-14). However,* Transmural plastic pigtail stents should not be retrieved before complete resolution of the PPC as determined by cross-sectional imaging, and usually not before three months of stenting in large PPCs due to slow drainage, owing to its small caliber. Risk of migration was noted to be high in drainage of large pseudocysts. The use of a single covered SEMS has then been proposed *(15-16).*

Procedure duration and resolution time are lower with SEMSs and this is probably related to the larger fistula diameter, while the technical success, clinical outcome, and complications are similar. Stents with specially designed feature to reduce migration rate are

also available. The design of the “NAGI” stent, with 20 mm large and acute angled flare ends, implies a decrease in the migration rates due to better anchoring in the gastric and pseudocyst extremes. More, the same is fully covered with silicone that prevents leakage and tissue ingrowth and with retrieval string allows for easy removal *(17-19.)*

Metal stents cause rapid decompression of PCCs. However, in the case presented, the initially inserted SEMS was replaced by double plastic pigtail stents due to incomplete drainage after one month. Studies show complications of SEMS when left in place after 4-8 weeks, which include bleeding, luminal perforation and stent migration *(20)*, thus the decision to replace it at after one month.
Recent retrospective case–control study found no significant difference in treatment success, reinterventions, clinical and stent-related adverse events between patients treated with SEMS versus plastic stents *(21).* Notwithstanding the increasing number of studies available looking at the safety and efficacy of plastic versus metal stents in the drainage of PCCs, because of the differing results and conclusions, the final verdict on the choice of stents is could not yet be arived at. The final answer to this management dilemma will be probably answered by a multicentric prospective comparative randomized study only.

CONCLUSION

Once a PPC is diagnosed, it must be determined whether it can be treated conservatively with the hope of spontaneous resolution, or if an intervention is necessary to prevent complications. The recent trend in the management of symptomatic PPC has moved toward less invasive approaches including EUS guidance.

EUS- guided transmural approach using SEMS for drainage of PPC is becoming more prominent due to the increased accuracy afforded by real-time high-resolution imaging and lower procedure duration and resolution time. The present case describes the step-by-step procedure done. This case report is intended to help interventional gastroenterologists base their therapeutic decisions about minimal invasive management of PPCs on the current state of therapeutic technology and published data.

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