Letter to the Editor

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RE: Tips and Tricks of Percutaneous Gastrostomy Under Image Guidance in Patients with Limited Access

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Index terms: *Gastrointestinal tract; Interventional procedure; Gastrostomy; Stomach; Colon*

Dear Sir:

We read with great interest the article by Chan et al. (1) in the March issue of *Korean Journal of Radiology* on their experience of modified radiology-guided percutaneous gastrostomy (MRPG). The authors proposed a technique to access the stomach in patients with upper digestive tract obstruction (UDTO). Following marking a patient's left liver inferior margin and room air-colonography, the authors punctured the gastric area using a 21G fine needle under X-ray guidance and withdrew their syringe gradually while injecting contrast medium. We noted that the gastrostomy may be performed using a 0.0035-inch hydrophilic guide wire and a 6.5-Fr angled catheter in almost 100% of patients contraindicated for endoscopy gastrostomy, including those with tortuous or tight cervical stenosis (2). In patients with a collapsed stomach, orally administered effervescent sodium bicarbonate powder can produce sufficient gas in the stomach to allow for a percutaneous needle puncture. In UDTO patients, diatrizoate meglumine can be directly injected into the gastric lumen under ultrasound (US) guidance, as reported by Pugash et al. (3) in 1995. Since the stomach appears collapsed with apposed multi-layer walls and virtual lumen on US, the needle tip is hardly seen. In such circumstances, after having transfixed the stomach with a 21G Chiba needle, further gradual needle withdrawing is performed under fluoroscopic guidance while injecting small amounts of diatrizoate meglumine until a ruga pattern is seen.

Moreover, a cancer patient's subcutaneous fat is often absent and the anterior gastric wall is close to the abdominal wall. High frequency US monitoring does improve needle visualization in such a circumstance. Conversely, in obese patients, back- and forth motions of the needle stylet under Doppler color US guidance clearly improves needle visualization. We noted that by using this technique we successfully performed percutaneous fluoroscopy gastrostomy (PFG) in two partially-gastrectomized patients who were contraindicated for endoscopic gastrostomy (2). Another condition precluding the traditional supracolic approach is the Chilaiditi sign, i.e. a usually asymptomatic interposition of the colon between liver and diaphragm. This condition may occur in patients with dolichocolon, chronic lung disease, cirrhosis, as well as ascites and right hemi-diaphragm palsy. Colonic opacification should always be performed prior to a gastrostomy to prevent the potential risk of gastrocolic fistula. Colonic opacification can be achieved using air inflation when starting a gastrostomy (1) or barium swallow 12 hours prior. We and others perform PFG using an uncomplicated controlled percutaneous gastropexy below the transverse mesocolon (2, 4). The PFG tract is made centrally on the gastropexy using a true right-angle 18G-needle to the skin surface, a 0.0038-inch Amplatz guidewire and serial dilators following cutaneous anesthesia down to peritoneum with 40 ml of 1% Lidocaine chlorhydrate. The needle (N) traverses

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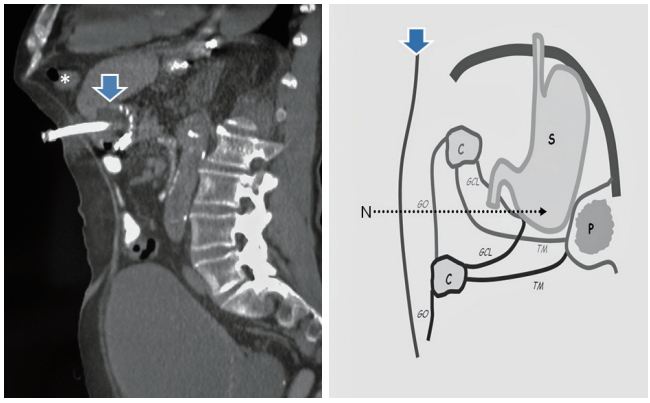

Fig. 1. Chilaiditi's gastropexy on sagittal CT - reformation (A) and anatomy (B).
A. Multidetector CT volume rendering sagittal reformation showing 17-Fr percutaneous mushroom gastrostomy button (arrow), below left liver. Note high location of transverse colon (*) without any sign of omental infarction. **B.** Chilaiditi's sign anatomy in grey color is compared to usual anatomy encountered at standard percutaneous gastrostomy (black color). Abdominal wall (arrow) and greater peritoneal sac lie anterior to stomach. During Chilaiditi's gastropexy, needle (N) traverses GO, TM, GCL, and lesser sac (between TM and GCL). C = transverse colon, GCL = gastrocolic ligament, GO = greater omentum, P = pancreas, S = stomach, TM = transverse mesocolon

the greater omentum (GO), transverse mesocolon (TM), gastrocolic ligament (GCL), and lesser sac (between TM and GCL). Four anchor hooks were then inserted with limited pressure, and a 17-Fr catheter subsequently placed through a peel-away sheath inside the stomach and below the transverse colon (Fig. 1). We noted that GO is known as the so-called "abdominal policeman" because it wraps itself around an inflamed organ thereby protecting other viscera from it. Literature data on infracolic PFG insertion are scarce (4): less than ten (uncomplicated) cases have been performed worldwide. The real contraindication of infracolic PFG includes hypopharyngeal/cervical esophageal neoplasia since the gastropexy precludes any further pull-up technique attempt.

In conclusion, contraindications for endoscopic gastrostomy include UDTO and Chilaiditi sign. We suggest that the fluoroscopy-guided gastrostomy Chan's technique can be improved using effervescent sodium bicarbonate powder and US guidance (3). In the case of the Chilaiditi sign, infracolic feeding tube placement can be performed if caution is paid to limit the pexy anchorage tension, provided that a close follow-up is performed to detect omental infarction or hemorrhage.

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Response

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Dear Editor:

We read the letter from Dr. Marcy and we have some comments. In difficult cases with marked stenosis of the oropharynx or upper esophagus, we used a 5-Fr angiographic catheter with a 0.035-inch hydrophilic guide-wire to replace the nasogastric tube for stomach inflation under fluoroscopic control (1). There has been a high successful rate for our patients, but we have also encountered a few complications of tumor bleeding when the hydrophilic guide-wire passing through cases with high-grade narrowing and/or nearly a completely obstructive oropharynx and esophagus, which were invaded by the tumor. In those cases, our approach was to control the tumor bleeding, but we terminated further catheter access into the stomach. In some other cases, we tried to locate the collapsed stomach by administering a small amount of sodium bicarbonate powder or water soluble contrast medium (Iothalamate meglumine 60%) orally, but the results were disappointing. Aspiration was found to be the most serious complication in patients with an obstructed oropharynx and esophagus when they were given sodium bicarbonate powder or water soluble contrast medium. Echo-guidance rapid puncture of the stomach was reported by Bleck et al. (2) and Lorentzen et al. (3) after filling the stomach with water via the nasal tube. Pugash et al. (4) have described using oral granules, which produced gas in the stomach, and de Baere et al. (5) described a similar technique using sodium bicarbonate powder orally as an effervescent. We have tried out the above reported procedures in our patients, but all of them failed because of high-grade narrowing and/or a nearly completed obstructive oropharynx and esophagus. Quadri et al. (6) reported a procedure to perform gastric puncture by initially using a 22G needle under direct ultrasound guidance, followed by injecting small amounts of contrast medium while withdrawing the needle under fluoroscopic guidance. Correct placement of the needle tip into the stomach was reassured by identifying the gastric rugae followed by air insufflation with air. We simplified the procedure using a direct gastric puncture under fluoroscopic guidance, which significantly shortened the procedure time. The advantages of this modified interventional technique are the simple steps, the shortest procedure time and the low complications rate.

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