Contents

OPINION REVIEW

1  Necessary problems in re-emergence of COVID-19
   Chen S, Ren LZ, Ouyang HS, Liu S, Zhang LY

REVIEW

8  COVID-19: An overview and a clinical update
   Krishnan A, Hamilton JP, Alqahtani SA, Woreta TA

ORIGINAL ARTICLE

Retrospective Cohort Study

24  Log odds of positive lymph nodes is a better prognostic factor for oesophageal signet ring cell carcinoma than N stage

36  Modified procedure for prolapse and hemorrhoids: Lower recurrence, higher satisfaction

47  Angiotensin converting enzymes inhibitors or angiotensin receptor blockers should be continued in COVID-19 patients with hypertension
   Tian C, Li N, Bai Y, Xiao H, Li S, Ge QG, Shen N, Ma QB

Retrospective Study

61  Massively prolapsed intervertebral disc herniation with interlaminar endoscopic spine system Delta endoscope: A case series

71  Primary lung cancer with radioiodine avidity: A thyroid cancer cohort study
   Lu YL, Chen ST, Ho TY, Chan WH, Wong RJ, Hsueh C, Lin SF

81  Is traumatic meniscal lesion associated with acute fracture morphology changes of tibia plateau? A series of arthroscopic analysis of 67 patients
   Chen YD, Chen SX, Liu HG, Zhao XS, Ou WH, Li HX, Huang HX

Observational Study

91  Role of relaxin in diastasis of the pubic symphysis peripartum

SYSTEMATIC REVIEWS

102  Chinese medicine formulas for nonalcoholic fatty liver disease: Overview of systematic reviews
    Dai L, Zhou WJ, Zhong LLD, Tang XD, Ji G
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>118</td>
<td>Comparative profile for COVID-19 cases from China and North America: Clinical symptoms, comorbidities and disease biomarkers</td>
<td>Badawi A, Vasileva D</td>
</tr>
<tr>
<td>133</td>
<td>META-ANALYSIS Polymerase chain reaction-based tests for detecting <em>Helicobacter pylori</em> clarithromycin resistance in stool samples: A meta-analysis</td>
<td>Gong RJ, Xu CX, Li H, Liu XM</td>
</tr>
<tr>
<td>175</td>
<td>Low-grade fibromyxoid sarcoma of the liver: A case report</td>
<td>Dugalic V, Ignjatovic II, Kovac JD, Ilic N, Sopta J, Ostojic SR, Vasin D, Bogdanovic MD, Dumić I, Mihovanović T</td>
</tr>
<tr>
<td>197</td>
<td>Pulmonary thromboembolism after distal ulna and radius fractures surgery: A case report and a literature review</td>
<td>Lv B, Xue F, Shen YC, Hu FB, Pan MM</td>
</tr>
<tr>
<td>204</td>
<td>Myeloid neoplasm with eosinophilia and rearrangement of platelet-derived growth factor receptor beta gene in children: Two case reports</td>
<td>Wang SC, Yang WY</td>
</tr>
<tr>
<td>211</td>
<td>Sclerosing angiomatoid nodular transformation of the spleen: A case report and literature review</td>
<td>Li SX, Fan YH, Wu H, Lv GY</td>
</tr>
<tr>
<td>218</td>
<td>Late recurrence of papillary thyroid cancer from needle tract implantation after core needle biopsy: A case report</td>
<td>Kim YH, Choi IH, Lee JE, Kim Z, Han SW, Hur SM, Lee J</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>232</td>
<td>Type A aortic dissection developed after type B dissection with the presentation of shoulder pain: A case report</td>
<td>Yin XB, Wang XK, Xu S, He CY</td>
</tr>
<tr>
<td>236</td>
<td>Hemosuccus pancreaticus caused by gastroduodenal artery pseudoaneurysm associated with chronic pancreatitis: A case report and review of literature</td>
<td>Cui HY, Jiang CH, Dong J, Wen Y, Chen YW</td>
</tr>
<tr>
<td>245</td>
<td>Endoscopic treatment for acute appendicitis with coexistent acute pancreatitis: Two case reports</td>
<td>Du ZQ, Ding WJ, Wang F, Zhou XR, Chen TM</td>
</tr>
<tr>
<td>252</td>
<td>Residual tumor and central lymph node metastasis after thermal ablation of papillary thyroid carcinoma: A case report and review of literature</td>
<td>Hua Y, Yang JW, He L, Xu H, Huo HZ, Zhu CF</td>
</tr>
<tr>
<td>262</td>
<td>Endoscopic salvage treatment of histoacryl after stent application on the anastomotic leak after gastrectomy: A case report</td>
<td>Kim HS, Kim Y, Han JH</td>
</tr>
<tr>
<td>267</td>
<td>Immunosuppressant treatment for IgG4-related sclerosing cholangitis: A case report</td>
<td>Kim JS, Choi WH, Lee KA, Kim HS</td>
</tr>
<tr>
<td>274</td>
<td>Intraparenchymal hemorrhage after surgical decompression of an epencephalon arachnoid cyst: A case report</td>
<td>Wang XJ</td>
</tr>
<tr>
<td>278</td>
<td>Krukenberg tumor with concomitant ipsilateral hydronephrosis and spermatic cord metastasis in a man: A case report</td>
<td>Tsao SH, Chuang CK</td>
</tr>
<tr>
<td>284</td>
<td>Simultaneous bilateral acromial base fractures after staged reverse total shoulder arthroplasty: A case report</td>
<td>Kim DH, Kim BS, Cho CH</td>
</tr>
</tbody>
</table>
ABOUT COVER

Editorial Board Member of World Journal of Clinical Cases, Dr. Antonio Corvino is a PhD in the Motor Science and Wellness Department of University of Naples “Parthenope”. After obtaining his MD degree from the School of Medicine, Second University of Naples (2008), he completed a residency in Radiology at the University of Naples Federico II (2014). Following post-graduate training at the Catholic University of Rome, yielding a second level Master’s degree in “Internal Ultrasound Diagnostic and Echo-Guided Therapies” (2015), he served on the directive board of Young Directive of Italian Society of Ultrasound in Medicine and Biology (2016-2018). His ongoing research interests involve ultrasound and ultrasound contrast media in abdominal and non-abdominal applications, mainly in gastrointestinal, hepatic, vascular, and musculoskeletal imaging. (L-Editor: Filipodia)

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Endoscopic salvage treatment of histoacryl after stent application on the anastomotic leak after gastrectomy: A case report

Hee-Sung Kim, Yook Kim, Joung-Ho Han

BACKGROUND
Endoscopic approach could effectively manage postoperative anastomotic leakage. Various endoscopic methods have been developed for the treatment of anastomotic leakage.

CASE SUMMARY
A 53-year-old woman developed anastomotic leak after laparoscopic proximal gastrectomy. Endoscopic clip closure failed due to strong wall tension; therefore, a fully covered self-expandable esophageal metal stent (fc-SEMS) was placed to cover the leak after it was filled with a mixture of fibrin glue and histoacryl. However, fluoroscopy with gastrograffin showed dye leaking out of the fc-SEMS. Using the previous fluoroscopic image for guidance, a catheter was inserted at the leakage site. The radiocontrast dye was injected and was seen spreading along the sinus tract. Thereafter, histoacryl was injected. Seven days after the last procedure, upper gastrointestinal contrast studies showed no leaks. The patient was subsequently discharged 9 d after histoacryl injection without any complications.

CONCLUSION
To seal an anastomosis leak after stent application, salvage technique using histoacryl injection at the leakage site with fluoroscopy guidance could be considered cautiously.

Key Words: Anastomotic leak; Stent; Histoacryl; Endoscopy; Gastrectomy; Gastric cancer; Case report

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**Core Tip:** Endoscopic treatment including stent deployment, clipping or fibrin glue is considered as a safe and effective treatment options for anastomotic leakage after gastrectomy. We successfully treated esophago-gastric anastomotic leakage with endoscopic salvage treatment of add-on histoacryl after fully covered self-expandable esophageal metal stent (fc-SEMS). Histoacryl injection after fc-SEMS application on the anastomotic leak should be considered as treatment option.

**Introduction**

Laparoscopic approach for treating gastric cancer has fewer complications than open approach[1]. Aside from Intra-abdominal bleeding, anastomotic leakage was the most common complication[2]. Treatment options include surgery, conservative approaches, or endoscopic interventions[3]. Being as high mortality following revisional surgery for anastomotic leakage, conservative endoscopic method developed to decrease complication. Endoscopic clip, fibrin glue, endoscopic placement of stents has a crucial role in the management of anastomotic leakage. Depending on the size and location of defect, a variety of endoscopic procedures can be selected[4]. There have been several reports of endoscopic treatment for anastomotic leak. However there have been no reports of combining endoscopic management with injection of histoacryl after stent application on anastomotic leak. Herein, we present a case of anastomotic leak treated with combining endoscopic management with stent and histoacryl.

**Case Presentation**

**Chief complaints**
A 53-year-old women consulted gastroenterology for anastomotic leak after proximal gastrectomy for gastric cancer.

**History of present illness**
A 53-year-old woman underwent a laparoscopic proximal gastrectomy for early gastric cancer. Daily drainage via Jackson-Pratt (JP) drain was not decreased until the fourth postoperative day. Fluoroscopy with gastrograffin revealed leakage from the anastomotic site.

**History of past illness**
Apart from present illness, she has had no previous significant medical history.

**Personal and family history**
Her family history had any relevance to this present illness.

**Physical examination**
On the fourth postoperative day, the patient developed abdominal pain. Physical examination revealed a temperature of 37.3 °C, a blood pressure of 110/60 mmHg, a pulse of 118/min, a respiratory rate of 22/min, and a diffusely tender abdomen without rebound or guarding.

**Laboratory examinations**
A complete blood count showed that the white blood cell count of 11.6 × 10^9, hemoglobin 11.2 g/dL, and a platelet count of 164 × 10^9/L. Other blood biochemical tests were normal.
**Imaging examinations**

On the fourth postoperative days, upper gastrointestinal (UGI) contrast studies revealed a leakage from anastomotic site, and endoscopy showed a lesion (Figure 1A). A fully covered self-expandable esophageal metal stent (fc-SEMS) (12 cm length, outer diameter 2.2 cm, Hanaro, Seoul, Korea) was placed to cover the leak. Subsequently, drainage was diminished to 15-20 mL/d. However, fluoroscopy with gastrograffin showed dye leaking out of the fc-SEMS. (Figure 1B)

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**FINAL DIAGNOSIS**

Unsuccessful sealing anastomotic leak with fc-SEMS after laparoscopic proximal gastrectomy.

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**TREATMENT**

Using the previous fluoroscopic image (Figure 1B) for guidance, a catheter (MTW Endoskpie, Dusseldorf, Germany) was inserted at the leakage site after puncturing the stent membrane. The radiocontrast dye was injected and was seen spreading along the sinus tract. Thereafter, 8 mm of histoacryl was injected into the sinus tract as the catheter was withdrawn (Figure 1C).

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**OUTCOME AND FOLLOW-UP**

Seven days after the last endoscopic procedure, UGI contrast studies showed no leaks (Figure 2A). One month later, endoscopy was performed to remove the stent and remnant histoacryl (Figure 2B arrow) was observed covering the site without leakage (Figure 2B).

---

**DISCUSSION**

Anastomotic leakage following gastrectomy for gastric cancer is a life-threatening complication, and revisional surgery has a high mortality rate. The treatment includes conservative management, endoscopic treatment, and surgery[5]. Surgery is generally recommended for patients in critical condition. Otherwise, conservative management with endoscopic management is sufficient for minimal anastomotic leakage. Endoscopic management including stent deployment, clipping or tissue sealant had been considered safe and effective for anastomotic leak[6-9]. Stent implantation achieved 70% complete healing in 115 patients with anastomotic leakage[10]. However stent migration often occur and stent-related pain, stricture were reported following repeated stent placement[11,12]. Endoscopic repair using clips proven to be effective for only small defect[13,14]. The use of tissue sealants may be effective in small leaks with long tracts. Histoacryl occludes leak instantly after contact with liquid and it also promote inflammatory reaction which improve vascularity and healing[15]. High-output gastrointestinal fistula are less likely to close with the tissue sealant alone[16]. In case series, the reported outcomes showed that combination therapy by using clips and stents along with glue are more successful[17]. To achieve best result, the quality of the tissue surrounding the defects, interrupting flow across defect, confirmation of continued integrity need to be considered[18].

Depending on the size and location of the defect, a variety of endoscopic procedures can be selected[19]. In failure to seal an anastomosis leak with a stent after gastrectomy, salvage technique using histoacryl injection at the leakage site, with fluoroscopy guidance could be considered cautiously.

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**CONCLUSION**

Postgastrectomy esophago-gastric leak is a serious complication. The endoscopic placement of fc-SEMS has become preferred treatment for esophageal anastomotic leakage. However, in failure to control leakage with fc-SEMS, salvage treatment with
Figure 1 Anastomotic leak after gastrectomy and subsequent histoacryl injection using fluoroscopy and catheter after failed stent application. A: A 4 mm diameter leak was identified at the esophago-gastric anastomotic site; B: A leak (arrow) still existed 3 d after stent application; C: Estimating the location using previous radiocontrast study, the catheter was introduced into sinus tract after puncturing stent membrane (arrow), then it was filled with histoacryl.

Figure 2 Contrast examinations finding after 1 mo after injection of histoacryl to the leak after puncture the stent membrane. A: The leak was obliterated with histoacryl; B: Endoscopy after stent removal showed remnant histoacryl (arrow) and complete closure.

Add-on histoacryl injection should be considered as a treatment option.

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