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Endoscopic Management of Sleeve Gastrectomy Leaks: Outcomes of SEMS and Non-Stented Strategies in a Single Tertiary Center

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Abstract

Background: Staple-line leaks following laparoscopic sleeve gastrectomy (LSG) cause substantial morbidity. Endoscopic options include self-expandable metal stents (SEMS), drainage with or without endoscopic closure, and endoluminal vacuum therapy (E-VAC).

Methods: We performed a retrospective cohort study of adults with imaging-confirmed post-LSG leaks treated at a tertiary bariatric center (2018–2023). Index management was SEMS (± fixation) or non-stented care (antibiotics, percutaneous/ endoscopic drainage, ± endoscopic closure). E-VAC was reserved as rescue after stent removal or failure of non-stented therapy. Primary outcomes were leak closure and time to healing.

Results: Fifty-seven patients were included; 23 received SEMS and 34 received non-stented care. Overall leak resolution occurred in 53/57 (93.0%). Closure was achieved in 22/23 SEMS patients (95.7%) and 31/34 non-stented patients (91.2%). Mean time to healing was 10.5 weeks in the SEMS group and 8.6 weeks in the non-stented group. Stent-related adverse events occurred in 6/23 (26.1%) SEMS patients and were managed with repositioning, exchange, or planned removal. E-VAC rescue therapy was used in 9 patients; all achieved leak closure (9/9, 100%), with closure documented over 4-8 weeks (mean 5.7 weeks; median 5 weeks).

Conclusions: Both SEMS-based and non-stented strategies achieved high closure in selected patients. We propose a pragmatic, goal-oriented pathway that aligns initial therapy with leak complexity and reserves E-VAC strictly as rescue; prospective validation is needed.

Abbreviations

FCSEMS = fully covered self-expandable metal stent; OTSC = over-the-scope clip; SG = sleeve gastrectomy; E-VAC = endoluminal vacuum therapy.

Introduction

Laparoscopic sleeve gastrectomy (LSG) is among the most performed bariatric operations worldwide. Despite technical refinements, staple-line leaks occur in ~1-3% and drive much of the morbidity, readmission, and cost after LSG [1-3]. Historically, management spanned conservative measures (antibiotics and percutaneous drainage) and early reoperation; however, neither approach reliably balances efficacy with patient comfort and organ preservation [4].

Over the last decade, endoscopy has redefined the treatment landscape. Fully covered self-expandable metal stents (SEMS) routinely achieve closure in >85-90% of post-LSG leaks, but migration and intolerance have limited durable success, particularly when dwell times are short or fixation is absent [8–13,15]. Newer techniques—including over-the-scope clip (OTSC) or endoscopic suturing fixation—appear to reduce migration to single-digit percentages and enhance dwell stability [13,15,17]. Parallel to stenting, endoluminal vacuum therapy (E-VAC) has emerged as an effective rescue strategy for chronic or complex defects and can facilitate granulation and source control in anatomies where stenting is suboptimal [16]. Yet, despite these advances, no broadly accepted, data-driven algorithm dictates the initial endoscopic choice; leak timing (acute vs subacute vs late), size/containment, patient stability, and local expertise all plausibly influence outcomes [5–7,12,14,16].

We report a single-center cohort of 57 post-LSG leaks managed between 2018 and 2023 using two index strategies—SEMS (± fixation) versus non-stented care (drainage ± endoscopic closure)—with E-VAC reserved as a rescue measure after stent removal or failed non-stented therapy. We aimed to: (1) describe patient/leak features and real-world outcomes for each strategy; (2) contextualize healing trajectories and complications relative to contemporary literature; and (3) present a pragmatic, goal-oriented pathway that aligns initial therapy with case complexity while explicitly acknowledging the limits of retrospective inference [5,10,12,15–17]. This manuscript builds upon—and explicitly distinguishes itself from—our earlier experience by integrating standardized fixation practices, transparent reporting of non-stented pathways, and an embedded statistical analysis plan. More importantly, all cases were managed at a single tertiary hospital by one coordinated endoscopy–surgery team, minimizing practice variation and ensuring a consistent protocol across the cohort.

Materials and Methods

The study was conducted in accordance with the Helsinki Declaration as revised in 2024. For this retrospective chart review, the requirement for informed consent was waived by the approving board.Ethical approval for this retrospective chart review was

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obtained from the Institutional Review Board (IRB No. 16208/16), and the requirement for informed consent was waived by the approving board.

Design and Oversight: Consent was waived for retrospective chart review. Reporting adheres to STROBE guidelines and includes a prespecified Statistical Analysis Plan (SAP).

Setting and case identification: Consecutive patients were identified through institutional surgical and endoscopy databases and cross-referenced with imaging reports. A post-LSG leak was defined by contrast extravasation on upper gastrointestinal swallow study or contrast-enhanced computed tomography, and/or direct endoscopic visualization of a defect with associated collection. Leak timing was classified as acute, subacute, or late according to the prespecified statistical analysis plan; for transparency we defined acute as ≤7 days, subacute as 8–42 days, and late as >42 days after index surgery.

Population: Consecutive adults with post-LSG staple-line leaks confirmed by contrast swallow or contrast-enhanced CT operated in major tertiary center from 2018-2023.

Supportive care: Across both pathways, patients received protocolized sepsis management and nutrition support. Source control was pursued through percutaneous or endoscopic drainage when a collection was present. Nutritional optimization (enteral feeding distal to the leak when feasible, or parenteral nutrition when necessary) was coordinated with bariatric surgery, nutrition, and interventional radiology teams.

Index Strategies: SEMS group—Fully covered SEMS with or without anti-migration fixation (OTSC or endoscopic suturing). Planned dwell 4–6 weeks with reassessment at removal. Non-stented group—Antibiotics, percutaneous or endoscopic drainage, and/or direct endoscopic closure (e.g., OTSC or endoscopic clipping). Rescue therapy: E-VAC is reserved for persistent leaks after stent removal or failure of non-stented therapy. E-VAC was not performed with a stent in situ.

SEMS pathway details: The SEMS strategy aimed to exclude gastric contents from the leak and restore luminal continuity. Fixation (over-the-scope clip or endoscopic suturing) was used when feasible to reduce migration risk, particularly in proximal leaks and when longer dwell times were planned. Stent dwell was typically 4–6 weeks, with earlier intervention reserved for clinical deterioration, intolerance, or device migration.

Non-stented pathway details: Non-stented management prioritized drainage, antimicrobial therapy, and selective endoscopic closure for small, contained defects in stable patients. Endoscopic closure options included through-the-scope clipping or OTSC for focal defects when local conditions were favorable (minimal inflammation, adequate drainage, and no large uncontained cavity).

Outcomes: Primary—leak closure (clinical/radiologic) and time-to-healing (weeks from index endoscopy to closure). Secondary—adverse events (AEs), stent migration, reinterventions, nutrition support, and length of stay.

Outcome definitions: Leak closure required clinical resolution with radiologic confirmation (no contrast extravasation) and/or endoscopic confirmation of healing. Time to healing was measured from the index endoscopic intervention (stent placement or first endoscopic/drainage procedure in the non-stented pathway) to the date closure was first documented. Adverse events were recorded using standard clinical documentation and included device migration, intolerance requiring early removal, bleeding, perforation, and need for re-intervention.

Statistical Analysis: Continuous variables were summarized as mean (SD) or median (IQR); categorical as n (%). Group comparisons used t-test/Mann–Whitney and chi-square/Fisher's exact. Time-to-healing with Kaplan–Meier medians (95% CI) and log-rank were informative. Adjusted models: logistic regression for closure and Cox proportional hazards for time-to-healing adjusted for leak timing (acute/subacute/late), leak size/containment, baseline drainage, and hemodynamic instability. Effect sizes with 95% CIs; sensitivity analyses excluded crossovers and modeled treatment as time-varying.

Data availability: De-identified data supporting the findings of this study are available from the corresponding author upon reasonable request.

Results

Fifty-seven patients met the inclusion criteria (mean age 35.8 ± 10.2 years; 61.4% female; mean BMI 42.1 ± 7.8 kg/m²). Leaks were diagnosed a mean of 19 days post-LSG. Twenty-three (40.4%) received SEMS (with/without fixation) and 34 (59.6%) received non-stented care consisting of antibiotics, targeted drainage, and/or endoscopic closure. Overall resolution occurred in 53/57 (93%). (Table I) demonstrates the demographic characteristics.

Additional leak-characteristic data were extracted from the study spreadsheet and are summarized by index strategy in (Table I-B). The median interval from sleeve gastrectomy to leak diagnosis was 13 days (IQR 7-25; mean 19.1; range 1-73), with 15 acute (<=7 days), 33 subacute (8-42 days), and 9 late (>42 days) leaks. By index strategy, SEMS patients were diagnosed earlier than non-stented patients (mean 14.2 vs 22.4 days; median 10 vs 16 days), and acute leaks were more frequent in the SEMS group (10/23, 43.5%) than in the non-stented group (5/34, 14.7%). Defects >10 mm were also more common with SEMS (15/23, 65.2%) than with non-stented care (12/34, 35.3%), whereas 5-10 mm defects were more frequent in the non-stented group (18/34, 52.9%). CT collection/abscess was common in both pathways (22/23, 95.7% vs 31/34, 91.2%). Contained/localized CT extravasation was observed in 16/23 (69.6%) SEMS patients and 20/34 (58.8%) non-stented patients; diffuse/uncontained extravasation was recorded only in SEMS patients (5/23, 21.7%), while no CT extravasation was recorded in 14/34 (41.2%) non-stented cases.

Table I-A: Baseline demographics (n=57)

Characteristic	Value
Number of patients	57
Female, n (%)	35 (61.4%)
Male, n (%)	22 (38.6%)
Mean age, years (range)	35.8 (17–57)
Mean BMI, kg/m² (range)	42.1 (26.5–64.9)
Mean time to leak, days (range)	19 (1–73)

Note: BMI: body mass index.

Table I-B: Baseline leak characteristics by index strategy

Characteristic	SEMS (n=23)	Non-stented care (n=34)	Overall (n=57)
Days from LSG to leak diagnosis, mean (range)	14.2 (3-50)	22.4 (1-73)	19.1 (1-73)
Days from LSG to leak diagnosis, median (IQR)	10 (5-18)	16 (10-26.8)	13 (7-25)
Acute leaks (<=7 days)	10/23 (43.5%)	5/34 (14.7%)	15/57 (26.3%)
Subacute leaks (8-42 days)	11/23 (47.8%)	22/34 (64.7%)	33/57 (57.9%)
Late leaks (>42 days)	2/23 (8.7%)	7/34 (20.6%)	9/57 (15.8%)
Leak size <5 mm	1/23 (4.3%)	4/34 (11.8%)	5/57 (8.8%)
Leak size 5-10 mm	7/23 (30.4%)	18/34 (52.9%)	25/57 (43.9%)
Leak size >10 mm	15/23 (65.2%)	12/34 (35.3%)	27/57 (47.4%)
Contained/localized CT extravasation	16/23 (69.6%)	20/34 (58.8%)	36/57 (63.2%)
Uncontained/diffuse CT extravasation	5/23 (21.7%)	0/34 (0.0%)	5/57 (8.8%)
No CT extravasation recorded	2/23 (8.7%)	14/34 (41.2%)	16/57 (28.1%)
CT collection/abscess present	22/23 (95.7%)	31/34 (91.2%)	53/57 (93.0%)

Note: Leak timing was classified as acute <=7 days, subacute 8-42 days, and late >42 days after LSG. The source spreadsheet recorded defect size in categories rather than exact continuous millimeter values, so a mean defect diameter was not recalculated. Contained/uncontained status was summarized using CT extravasation coding (localized vs diffuse), and CT collection was used as the available abscess/source-control surrogate.

Closure occurred in 22/23 (95.7%) SEMS patients (mean healing 10.5 weeks) and 31/34 (91.2%) non-stented patients (mean healing 8.6 weeks). At face value, the non-stented cohort exhibited a shorter crude time-to-healing; however, non-stented cases were more likely to represent earlier or contained leaks, suggesting that case-mix explains much of the difference. In keeping with our hypothesis-generating posture, we report descriptive measures and refrain from making claims of superiority.

Stent-related adverse events occurred in 6/23 (26.1%) SEMS patients (predominantly migration or intolerance) and were managed with repositioning, exchange, or planned removal. Adverse-event profiles were otherwise comparable between pathways.

E-VAC therapy was reserved for persistent leaks after stent removal or failure of non-stented therapy. Consistent with best practice, E-VAC was not performed with a stent in situ;Timing was individualized in collaboration with surgery and nutrition teams, while sponge-exchange frequency/count was not clearly reported in the source records. Table II demonstrates the outcomes of both groups (stented and non-stented) and summarizes E-VAC rescue variables.

E-VAC was used as rescue therapy in 9 patients. All 9 patients achieved leak closure (9/9, 100%). Time to closure after E-VAC was 6, 5, 7, 4, 6, 8, 5, 5, and 5 weeks (mean 5.7 weeks; median 5 weeks; range 4-8 weeks). Sponge-exchange frequency/count was not clearly reported in the source records. Although the exact sponge-exchange count was not consistently captured, the E-VAC pathway was managed as a prolonged rescue course: sponges were generally exchanged under general anesthesia at longer intervals, approximately every 5 days when clinically stable, with an expected average total of 10-11 sponge-exchange procedures per patient and total treatment lasting 4-8 weeks until leak healing.

Table II: Outcomes by index strategy and E-VAC rescue outcomes

Outcome	SEMS (n=23)	Non-stented care (n=34)	Overall (n=57)
Leak closure	22/23 (95.7%)	31/34 (91.2%)	53/57 (93.0%)
Mean time to healing, weeks	10.5	8.6	9.4*
Stent-related adverse events	6/23 (26.1%)	—	6/57 (10.5%)
Rescue E-VAC used	NR by index strategy	NR by index strategy	9/57 (15.8%)
E-VAC closure	--	--	9/9 (100%)
E-VAC closure time, weeks	--	--	6, 5, 7, 4, 6, 8, 5, 5, 5 (mean 5.7; median 5; range 4-8)
Sponge-exchange frequency/count	--	--	Not clearly reported; exact counts NR; sponge exchange typically about every 5 days under GA when clinically stable; expected burden 10-11 exchanges over 4-8 weeks

*Overall mean time to healing calculated as the weighted mean of group means. Abbreviations: SEMS = self-expandable metal stent. E-VAC rows summarize rescue therapy; distribution by index strategy and sponge-exchange frequency/count were not clearly reported. NR = not reported. GA = general anesthesia. The 10-11 sponge-exchange figure reflects the expected E-VAC procedure burden rather than a chart-derived exchange count.

The revised algorithm, therefore, functions less as a head-to-head comparison and more as a triage map: SEMS for uncontained/large or later leaks where luminal exclusion aids healing; non-stented care for early/contained leaks where drainage and local closure suffice. The aggregate results—high closure across arms with different case profiles—support this pragmatic selection logic.

These findings underscore that, in a real-world cohort where management is triaged by leak complexity, both luminal exclusion (SEMS) and drainage-centered strategies can deliver high closure. Given the observational design, comparisons of healing time should be interpreted as descriptive and primarily reflective of baseline leak features and clinical stability at presentation.

Discussion

This experience aligns with the broader literature, which demonstrates that endoscopic therapy has largely supplanted routine surgery for post-LSG leaks. SEMS achieves high closure rates in appropriately selected patients, and E-VAC provides an effective rescue option [8-13, 15, 16]. Device migration has historically limited SEMS, but contemporary fixation (OTSC or suturing) can reduce migration to <10% and may improve comfort and dwell stability [13,15,17]. Non-stented strategies (drainage ± endoscopic closure) offer credible efficacy in earlier, contained defects—potentially explaining shorter crude healing times in that subgroup—yet require meticulous source control and nutritional optimization [6,12].

Interpretation must remain cautious, as this is a retrospective, single-center series with selection bias—sicker or later leaks are more likely to be triaged to SEMS—and limited power to support multivariable adjustment. As such, we position our algorithm as operational and testable, not definitive. Future work should (i) prospectively capture leak timing/size/containment with standardized imaging; (ii) predefine fixation and dwell protocols; (iii) compare SEMS vs E-VAC as index therapy in late or uncontained leaks; and (iv) evaluate patient-reported outcomes and cost. Emerging innovations—including biodegradable or drug-eluting stents and AI-assisted risk stratification—may further personalize device choice and aftercare [14,18].

Our results support a triage-first pathway in which the leak's biology—timing, size/containment, and clinical stability—selects the initial endoscopic track rather than a one-size-fits-all doctrine. In practice, earlier, contained defects (often already drained) performed well with a non-stented approach (antibiotics, targeted drainage, ± focal closure), while later, larger, or uncontained defects benefited from SEMS with fixation to restore luminal physiology and promote healing (Figures 1–2) (Tables I–II). The apparent crude difference in healing time favoring the non-stented group mirrors this selection, not superiority. This is reinforced by the statistical panel, which shows no significant difference in closure ($p = 0.743$) yet a significant difference in crude healing time ($p < 0.001$)—a case-mix signal rather than evidence of an intrinsic advantage (Figure 4). Stent-related AEs, dominated by migration, were manageable and mitigated by routine fixation (OTSC/sutures) (Figure 3) (Table II)

Accordingly, the Goal-Oriented Algorithm (Figure 6) operationalizes three bedside signals at diagnosis—timing, size/containment, and stability/drainage—to determine whether to choose between Non-stented Care (for small, contained, early leaks) and SEMS+ Fixation (for large/uncontained, or late leaks). We emphasize that there is no E-VAC with a stent in situ. Reassessment is planned after stent removal at 4–6 weeks, not at 10–14 days, unless clinical deterioration compels an earlier intervention. If a leak persists after the planned dwell (or after non-stented therapy), escalation proceeds to E-VAC as a rescue measure, with integrated sepsis and nutrition bundles throughout the pathway; sponge-exchange frequency/count was not clearly reported in the source records. This algorithm harmonizes our cohort's real-world performance with contemporary device behavior (migration reduction via fixation) and provides a reproducible, bedside-ready framework for multicenter validation (Figures 1-6) (Tables I–III). When E-VAC is selected, the need for serial sponge exchanges should be anticipated early, as this prolonged treatment phase can increase procedural burden and resource use despite high closure potential.

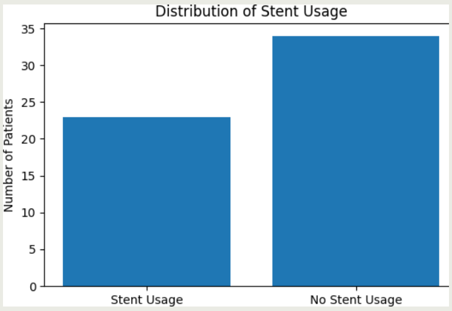

Figure 1: Distribution of index strategy (SEMS ± fixation vs non-stented care) in the study cohort (n=57).

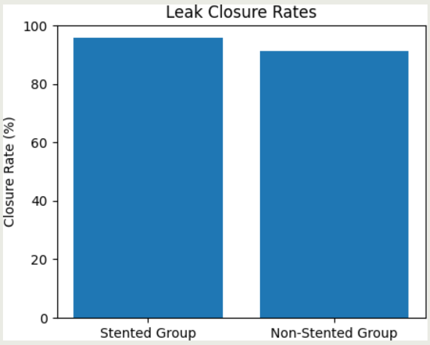

Figure 2: Leak closure rates by index strategy.

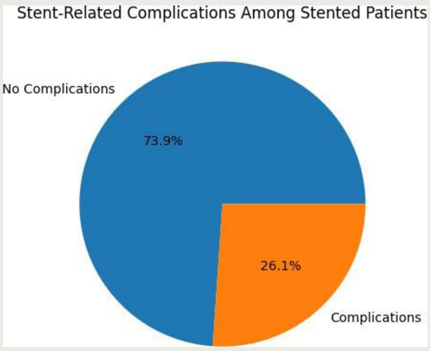

Figure 3: Stent-related adverse events among SEMS patients (n=23).

Finally, prevention remains paramount. Standardized staple-line reinforcement, intraoperative leak testing, and real-time perfusion assessment (e.g., indocyanine green) may reduce index leak rates to approximately 1%, while rapid, protocolized sepsis control and nutrition support likely improve healing once a leak occurs. Our revised pathway consolidates these principles into a coherent bedside tool that warrants multicenter validation.

Our closure rates are consistent with contemporary series reporting high success for fully covered SEMS when combined with aggressive source control. [8-13,15]. At the same time, internal drainage and selective closure have been increasingly used for early, contained leaks, offering a stent-sparing pathway in appropriately selected patients.[6,12]. The practical implication is that 'one device for all leaks' is unlikely to be optimal; instead, standardized triage criteria can help align therapy with the dominant physiological goal (exclusion vs drainage vs closure).

Stent migration remains the central limitation of SEMS therapy. Systematic efforts to fixate stents with OTSC or suturing have been associated with lower migration rates in the recent literature and can improve dwell stability, particularly for proximal defects. [13,15,17]. In our cohort, stent-related adverse events were manageable, supporting the feasibility of routine fixation as part of a standardized SEMS pathway.

E-VAC therapy has expanded the endoscopic armamentarium for chronic or complex leaks by enabling continuous drainage and granulation. It is resource intensive and often requires multiple endoscopies, but can be effective as rescue when luminal exclusion

Table III: Key studies from the last 10 years on endoscopic stenting for post-sleeve gastrectomy leaks

Study	Year	Design / population	Endoscopic approach	Key findings (summary)
Bashah et al.	2020	Retrospective review (n=73) post-SG leaks	FCSEMS vs OTSC for selected small leaks	Algorithmic selection; reported high overall healing (~97%) without surgical conversion in their series.
Donatelli et al.	2015	Single-center experience (n=16) post-SG leaks	Endoscopic internal drainage (EID) ± SEMS	Reported ~81% closure; emphasized combining drainage with endoscopic therapy to support source control.
Shehab et al.	2016	Single-center post-bariatric leaks (SG + bypass)	Large/“mega” FCSEMS + OTSC (“clip & stent”)	Reported ~90% closure and suggested fixation may help mitigate migration.
Martin Del Campo et al.	2018	Single-institution experience (n=21) SG leaks	Fully covered stents	Reported ~90% closure; migration reported (~24%); some required exchange to maintain coverage.
de Moura et al.	2019	Multicenter study (n=37) post-SG leaks	Novel large-caliber fully covered stent	Migration reported (~21%); tolerance may improve with newer designs, although adverse events were described.
Billmann et al.	2022	Retrospective consecutive patients with SG staple-line leaks	Mega stent vs smaller stent	Higher success reported with mega stent (91% vs 50% in their sample); migration ~30%; earlier oral intake and shorter hospitalization were reported.
Jena et al.	2023	Systematic review of fixation methods for SEMS	OTSC fixation of SEMS	Reported lower migration with fixation compared with no fixation across included studies.
Leeds et al.	2016	Registry/series of E-VAC for SG staple-line leaks	Endoluminal vacuum therapy	Supported E-VAC as an option for persistent leaks; many patients in reported series also underwent SEMS as part of multimodal management.

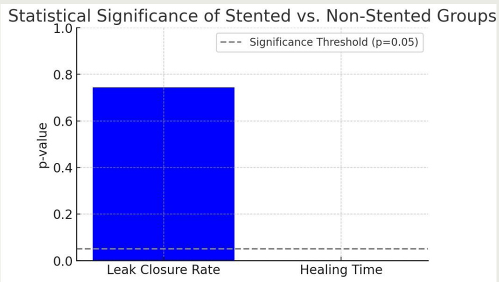

Figure 4: Bar chart illustrating the statistical significance (p-values) for the comparison between stented and non-stented cohorts:

- Leak Closure Rate: Not statistically significant (p = 0.743, blue bar).
- Healing Time: Statistically significant (p < 0.001, red bar).

The dashed line at p = 0.05 indicates the conventional threshold for statistical significance.

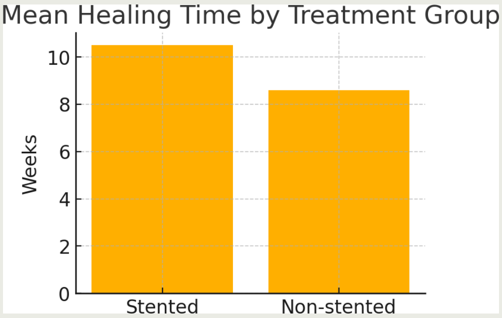

Figure 5: Mean Healing Time by Treatment Group

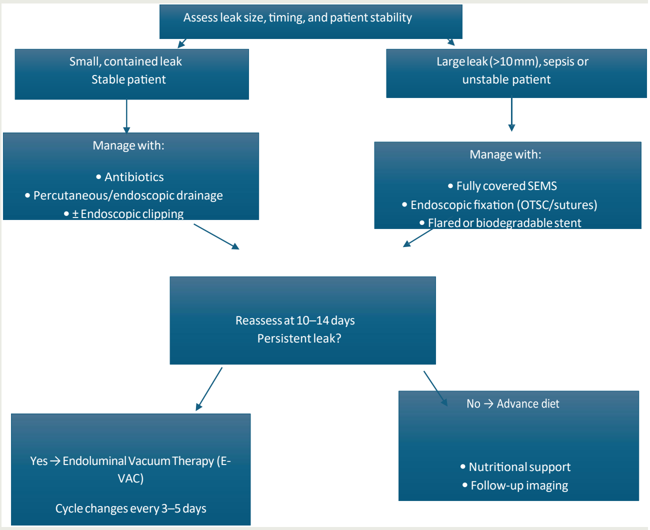

Figure 6: Goal-Oriented Algorithm for Post-Sleeve Leak Management

alone is insufficient. [16,17]. Our protocolized separation—no E-VAC with a stent in situ—reflects the need to avoid competing mechanisms and to ensure adequate cavity access for vacuum therapy. In our rescue cohort, E-VAC was used in 9 patients and achieved closure in all cases, with healing documented over 4-8 weeks (mean 5.7 weeks; median 5 weeks), reinforcing its role as a salvage option after stent removal or failed non-stented therapy. Its use should also be interpreted in light of procedure burden: E-VAC commonly requires repeated sponge exchanges under general anesthesia at longer intervals of approximately every 5 days when the patient is clinically stable, with an expected average total of 10-11 exchanges per patient.

Limitations warrant emphasis. First, treatment assignment was not randomized and was influenced by leak timing, size/containment, drainage status and clinical stability; residual confounding is therefore unavoidable. Second, patient-reported outcomes (tolerance, dysphagia, quality of life) and cost were not captured systematically. Third, the sample size limits precision for multivariable modeling, and some model outputs cannot be fully reproduced from summary data. Nevertheless, the value of this series lies in its pragmatic operationalization of a triage-first pathway and its clear separation of index strategies and rescue escalation.

From an implementation standpoint, we propose that future prospective work should standardize: (i) definitions and imaging schedules for leak characterization; (ii) dwell time and fixation criteria for SEMS; (iii) drainage and nutrition bundles common to both pathways; and (iv) objective escalation triggers to E-VAC or surgery.

Such standardization would enable higher-quality comparisons and would support multicenter validation of bedside algorithms.

From a technical standpoint, SEMS success is rarely "just placing a stent." Adequate sizing and positioning to cover the defect and to bridge the gastroesophageal junction when necessary, combined with measures that minimize migration (fixation, appropriate dwell, and structured follow-up), likely explain why newer series report lower migration than early experience. [13,15,17] Standardizing peri-procedural care—acid suppression, symptom-driven reassessment, and clear triggers for exchange or early removal—may also improve tolerance and reduce unplanned interventions. Importantly, prolonged dwell without reassessment risks pressure injury; conversely, premature removal risks persistent leakage. Our pathway therefore favors a planned dwell window (4–6 weeks) with reassessment at removal, while allowing earlier action for clinical deterioration.

The non-stented pathway similarly benefits from protocolization. Drainage is the cornerstone: when collections are adequately drained, small and contained defects may close with antibiotics, nutritional optimization, and selective endoscopic closure. Internal drainage strategies have been increasingly adopted in the literature as a "drain-first" approach, particularly for early leaks with a mature cavity. [6,12] In practice, candidacy for focal closure depends on local tissue conditions (inflammation, necrosis), defect geometry, and whether the cavity is collapsing under drainage; attempting definitive closure without source control risks failure and recurrent sepsis. These considerations support the central premise of our algorithm: match the first-line goal (drain vs exclude) to leak biology rather than to operator preference alone.

Finally, the algorithm is meant to be measurable. Prospective validation should predefine bedside variables (timing, size/containment, drainage status, stability) and auditable endpoints (closure, time to oral intake, procedure burden, adverse events, and patient-reported tolerance). Algorithm adherence and crossovers should be captured explicitly, and reporting should follow STROBE to facilitate comparison across centers. [5–7,14,18] With such data, the field can move beyond device-by-device debates toward reproducible pathways that integrate drainage, exclusion, and rescue therapy in a coherent escalation framework.

Beyond closure, patient-centered outcomes matter: dysphagia, reflux, nausea, procedure burden, length of stay, and time to resumption of oral intake can differ meaningfully between strategies even when closure rates are similar. Future studies should therefore incorporate standardized symptom assessment and cost/resource metrics alongside imaging-confirmed healing. Such outcomes will help refine thresholds for stent fixation, dwell time, and escalation to E-VAC or surgery.

Registry-based, pragmatic trials may be particularly suitable for this question because leaks are uncommon and heterogeneous, yet pathway-level standardization is feasible across bariatric centers.

Conclusions

In post-sleeve gastrectomy leaks, the strategy should follow the leak, not the other way around. Our triage-first pathway utilizes three bedside signals (timing, size/containment, and stability/drainage) to select either non-stented care for early, contained defects or SEMS with routine fixation for late, large, or uncontained leaks, with E-VAC reserved strictly as a rescue measure after stent removal. Across our cohort, both tracks achieved high closure rates; apparent differences in healing time reflect case mix rather than inherent superiority. Embedding sepsis control and nutrition bundles is integral to success. These real-world results are hypothesis-generating and invite prospective, multicenter validation focused on patient-centered outcomes—faster healing, fewer procedures, better tolerance, and earlier return to nutrition.

Work Was Done:

Department of Surgery, Hamad Medical Corporation, Doha, Qatar

Patient Permission/Consent Declarations: For this retrospective chart review, the requirement for informed consent was waived by the approving Institutional Review Board (IRB No. 16208/16).

Authors' contributions

Nesreen Khidir: Conceptualization of the manuscript and data curation. Moamena El Matbouly: writing the manuscript and data analysis, Moataz Bashah: conceptualization of the manuscript, and proofreading , Mohammed Al-Kuwari:: data validation and conceptualization of the manuscript, and proofreading.

References

1. Gagner M, Kemmeter P (2020) Comparison of laparoscopic sleeve gastrectomy leak rates in five staple-line reinforcement options: a systematic review. Surg Endosc 34: 396-407.
2. Brethauer SA, Hammel JP, Schauer PR (2009) Systematic review of sleeve gastrectomy as staging and primary bariatric procedure. Surg ObesRelat Dis 5: 469-475.
3. Noel P, Nedelcu M, Gagner M (2016) Impact of the Surgical Experience on Leak Rate After Laparoscopic Sleeve Gastrectomy. Obes Surg 26: 1782-1787.
4. Deitel M, Gagner M, Erickson AL, Crosby RD (2011) Third International Summit: current status of sleeve gastrectomy. Surg ObesRelat Dis 7: 749-759.
5. Bashah M, Khidir N, El-Matbouly M (2020) Management of leak after sleeve gastrectomy: outcomes of 73 cases, treatment algorithm and predictors of resolution. Obes Surg 30: 515-520.
6. Donatelli G, Dumont JL, Cereatti F, Ferretti S, Vergeau BM, et al. (2015) Treatment of leaks following sleeve gastrectomy by endoscopic internal drainage (EID). Obes Surg 25: 1293-1301.
7. Nimeri A, Ibrahim M, Maasher A, Al Hadad M (2016) Management algorithm for leaks following laparoscopic sleeve gastrectomy. Obes Surg 26: 21-25.
8. Eisendrath P, Cremer M, Himpens J, Cadiere GB, Moine OL, et al. (2007) Endotherapy including temporary stenting of fistulas of the upper gastrointestinal tract after laparoscopic bariatric surgery. Endoscopy 39: 625-630.
9. Swinnen J, Eisendrath P, Rigaux J, et al. (2011) Self-expandable metal stents for the treatment of benign upper GI leaks and perforations. GastrointestEndosc 73: 890-899.
10. Martin Del Campo SE, Mikami DJ, Needleman BJ, Noria SF (2018) Endoscopic stent placement for treatment of sleeve gastrectomy leak: a

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single institution experience with fully covered stents. Surg ObesRelat Dis 14: 453-461.

11. Eubanks S, Edwards CA, Fearing NM Ramaswamy A, de la Torre R,, et al. (2008) Use of endoscopic stents to treat anastomotic complications after bariatric surgery. J Am Coll Surg 206: 935-938.
12. Bouchard S, Eisendrath P, Toussaint E,Moine OL, Lemmers A , et al. (2016) Trans-fistulary endoscopic drainage for post-bariatric abdominal collections communicating with the upper gastrointestinal tract. Endoscopy 48: 809-816.
13. Shehab HM, Hakky SM, Gawdat KA (2016) An endoscopic strategy combining mega-stents and over-the-scope clips for the management of post-bariatric surgery leaks and fistulas (with video). Obes Surg 26: 941-948.
14. de Moura DTH, de Moura EGH, Neto MG, Jirapinyo P, et al. (2019) Outcomes of a novel bariatric stent in the management of sleeve gastrectomy leaks: a multicenter study. Surg ObesRelat Dis 15: 1241-1251.
15. Billmann F, Pfeiffer A, Sauer P,Billeter A, Rupp C, et al. (2022) Endoscopic stent placement can successfully treat gastric leak following laparoscopic sleeve gastrectomy if and only if an esophagoduodenalmegastent is used. Obes Surg 32: 64-73.
16. Leeds SG, Burdick JS (2016) Management of gastric leaks after sleeve gastrectomy with endoluminal vacuum (E-VAC) therapy. Surg ObesRelat Dis. 2016;12: 1278-1285.
17. Jena A, Chandnani S, Jain S, Sharma V, Rathi P (2023) Efficacy of over-the-scope clip fixation for preventing migration of self-expandable metal stents: a systematic review and meta-analysis. Surg Endosc.37: 3410-3418.
18. Bellini V, Valente M, Turetti M, Rio PD, Saturno F, et al. (2022) Current applications of artificial intelligence in bariatric surgery. Obes Surg 32: 2717-2733.