

# Drainage of walled-off necrosis: when can I still use plastic stents?



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In many endoscopy units, lumen-apposing metal stents (LAMS) have become standard equipment for endoscopic ultrasound (EUS)-guided drainage of walled-off pancreatic necrosis (WON). Yet before LAMS were available, endoscopists treated WON with much cheaper double pigtail plastic stents (DPPS), and in some practice settings, the cost of a single LAMS can exceed the entire remaining cost of endoscopic care for a patient with WON. The study from Kakadiya and colleagues, published in this issue of the journal [1], adds to a growing body of literature that challenges the routine use of LAMS for drainage of WON. The current study asks: When compared to metal stents, do plastic stents result in inferior patient outcomes?

The authors conducted a prospective, randomized, non-inferiority trial comparing LAMS to DPPS in the management of symptomatic WON. Enrolled patients had not undergone prior drainage procedures, and were estimated to have > 20% solid component in their walled-off collections by EUS imaging. Study participants received either a LAMS (15- or 16-mm diameter) or dilation of the transmural tract to 15mm followed by placement of two DPPS. All drainage procedures were transgastric. Collections were reimaged at 72 hours, 3 weeks, and 3 months, and endoscopic necrosectomy was performed when there was either persistent or new-onset systemic inflammatory response syndrome (SIRS) or organ failure. LAMS were removed at 3 weeks and replaced with plastic stents if there was a persistent collection or a disconnected pancreatic duct. Treatment success, the primary outcome, was defined as both radio-

logical resolution of the WON (by computed tomography or magnetic resonance imaging) and resolution of clinical symptoms at 3 weeks after initial endoscopic drainage. Treatment success was achieved in 87.5% of the LAMS group and 83.3% of the DPPS group, rejecting the null hypothesis that DPPS are inferior to LAMS. Limitations of the study include use of EUS to estimate the degree of solid contents in WON (a method that lacks validation), as well as reliance on transabdominal ultrasound to exclude residual or recurrent collections after 3 months (a secondary outcome), and limited statistical power.

There have been three previous prospective, randomized controlled trials (RCTs) published comparing metal vs. plastic stents for drainage of WON, as well as at least eight retrospective cohort studies, two retrospective case-control studies, and seven meta-analyses. The retrospective series reported varying results, with most favoring LAMS (including a study from my group), and the two case-control studies came to opposite conclusions. The three prior RCTs, together with a fourth study that compared data from two prospective studies, came to remarkably concordant conclusions: They found no statistically significant differences in success rates, adverse event rates (so long as LAMS were removed early to avoid late bleeding), length of hospital stay, total number of endoscopic procedures or necrosectomies, or mortality between metal and plastic stents [2, 3, 4, 5]. Total procedure costs were twice as high in the LAMS group in the one study that assessed this [3], although total healthcare costs were comparable between groups for studies

performed in the United States and Europe [3,5]. In one of these studies, use of 20-mm-diameter LAMS was not associated with improved outcomes compared to 15-mm-diameter LAMS, suggesting that large pieces of necrotic tissue may continue to obstruct stents regardless of their diameter [5]. A recent meta-analysis incorporating data from the three RCTs confirmed the lack of difference in clinical outcomes between LAMS and DPPS [6]. The one consistent benefit of LAMS was shorter duration of the endoscopic drainage procedure, requiring only about half the time of DPPS drainage.

The current study is the first RCT of LAMS versus DPPS reported from the context of a developing economy, where resources may be constrained and the cost of care may have a larger impact on treatment decisions. This is reflected in the fact that some patients were excluded from enrollment because they could not afford to pay for a LAMS, should they be randomized to that study arm. The WONs drained in this study were also considerably older than in the three prior RCTs, with median time from onset of pancreatitis to drainage of 8 to 12 weeks, compared to 4 to 6 weeks in the American and European studies. This likely reflects limited patient access to therapeutic EUS and a bias toward conservative management in resource-constrained settings. The need for endoscopic necrosectomy was lower than in the other RCTs, and high success rates were seen after just 3 weeks in both study arms in the current study, likely reflecting treatment of older, more mature collections whose solid contents had detached from the collection wall and were at least partially liquified. The current study demonstrates that LAMS and DPPS can be used to drain WON with equivalent clinical outcomes despite the challenges to patient care that may be encountered in resource-constrained settings. It also reminds us that, when possible, waiting to drain WON allows collections to simplify and often results in simpler and shorter-duration interventional treatment [7].

The currently available prospective studies show no benefit of LAMS over DPPS with regard to important clinical endpoints. However, electrocautery-capable LAMS clearly have two advantages for drainage of WON, namely shorter endoscopic procedure time and simpler endoscopic technique. In busy endoscopy units that treat patients who do not pay directly for the costs of their own care, the 15 to 20 minutes of procedure time saved by using LAMS may justify their use. And, colleagues recently trained in resource-rich environments may not have much experience with the DPPS technique and may not be comfortable using plastic stents, particularly in countries such as the United States where cystotomes are not yet available for initial dilation of the transmural tract. There may also be unusual circumstances, such as initial WON drainage in a patient who must remain on anticoagulants, or drainage of a WON that does not directly appose the gut wall, where LAMS have a benefit over DPPS. However, from a global perspective, none of these factors are compelling. Those of us who train endoscopists should aim to give trainees adequate experience with both methods of fluid collection drainage. Societal guidelines suggest that the learning curve is similar for these techniques [8,9].

When can you still use plastic stents for drainage of WON? The answer, based on the best available data, is: all the time, if you so choose! It is likely that other factors are more important determinants of patient outcome than the choice of plastic or metal stents. These include correct case selection, careful pre-procedure review of cross-sectional imaging studies, timing of intervention, creation of multiple transluminal drainage sites [10], nutritional support, protocolized rather than symptomatic follow-up [11], a collaborative and multidisciplinary approach, and a commitment to care for and support our patients until they fully recover.

## Conflict of Interest

The authors declare that they have no conflict of interest.

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