EUS-Guided Broad Plexus Neurolysis Over the Superior Mesenteric Artery Using a 25-Gauge Needle

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Endoscopic ultrasound guided celiac plexus neurolysis (EUS-CPN) is effective in relief of pain in patients with pancreatic cancer in up to 70 – 80 % of patients. However, many of the patients have suboptimal pain relief because of various reasons like technical failure, presence of undiagnosed non visceral pain caused by invasion of muscle and connective tissue or all the pain impulses from the abdominal viscera have not been blocked by standard EUS-CPN because of disseminated intra abdominal spread of malignancy. In this study, the authors compared the effectiveness of standard EUS-CPN with that of EUS-guided broad plexus neurolysis (EUS-BPN) performed using 25-gauge needle over the superior mesenteric artery (SMA) in patients with advanced abdominal cancer. The authors used EUS BPN over SMA because they hypothesized that better pain relief might be achieved as this could interrupt extensive pain impulses from the abdomen as upper inferior mesenteric plexus, abdominal aortic plexus and the lumbar ganglion are situated on the lateral and anterior aspects of the aorta between the origins of the SMA and the inferior mesenteric artery (IMA).

The authors enrolled 76 patients with upper abdominal pain due to unresectable pancreatic cancer or intra-abdominal metastatic cancer and of these, 37 and 39 were offered EUS-CPN and EUS-BPN respectively. After exclusion, 67 patients were finally enrolled and of whom 34 and 33 patients received EUS-CPN and EUS-BPN respectively. Bilateral injection was used for both the techniques. In the EUS-CPN procedure, the 22-gauge needle was placed under direct EUS visualization adjacent and anterior to the lateral aspect of the aorta at the level of over or next to the celiac artery trunk. In the EUS-BPN procedure, a 25-gauge needle was placed under direct EUS visualization adjacent and anterior to the lateral aspect of the aorta over the level of the SMA trunk. A mixed solution of 9 ml of pure alcohol and 1 ml of contrast material was injected on each side. CT scan of the abdomen was performed immediately after the procedure to confirm the injection site and evaluate the upper and lower limits of the neurolytic/contrast spread. Pain intensity was measured according to a standardized visual 11-point continuous analog scale (VAS). A drop in VAS score by ≥ 3 points after the procedure was rated as good response. The pain relief was analyzed on days 7 (short-term pain relief) and 30 (long-lasting pain relief).

There was no significant difference in the age, gender ratio, type of disease, or therapy between the two groups. The EUS BPN group had more widespread neurolytic spread in comparison to the EUS CPN group. The reduction in VAS score on days 7 and 30 was found to correlate with the extent of the contrast spread, thereby supporting the authors hypothesis that blocking extensive pain impulses could lead on to better pain relief. In the EUS-CPN group, the mean VAS scores before the procedure and on days 7 and 30 after the procedure were 7.8±1.1, 3.9±2.0, and 4.8±2.2, respectively. The mean scores for EUS-BPN group were 7.8±1.2, 2.5±1.9, and 3.4±2.5, respectively. The EUS-BPN group had a significantly greater reduction in the VAS scores on days 7 and 30 than the EUS-CPN group (p < 0.05). For the upper abdominal cancer patients, the EUS-CPN and EUS-BPN procedures did not differ significantly in terms of efficacy. However, the EUS-BPN procedure was significantly more effective for the lower abdominal cancer patients as 79 % (15 / 19) achieved good long-lasting pain relief after EUS-BPN, whereas only 19 % (3 / 16) of the EUS-CPN patients achieved this (p < 0.05). No serious complications were observed in this study.

Commentary

The management of pain associated with pancreatic or intra abdominal cancers is often challenging. Celiac plexus neurolysis (CPN) has been performed for almost 100 years as a means of alleviating pain of pancreatic or retroperitoneal origin, and a variety of techniques, routes, and chemical agents have been used to maximize efficacy and minimize complications. In the last decade, EUS CPN has been described as an alternative safer approach and is now widely practiced for relief of pain because of unresectable malignancies. Although CPN is effective, current evidence suggests that it results in a mild-to-moderate sustained reduction of pain in pancreatic cancer and results in decreased opioid use but does not eliminate the need for opioids. Also, it may not be effective for pain relief in patients with lower abdominal malignancies or patients with widespread malignancies. The authors in the current study...
have demonstrated that EUS-BPN resulted in broad neurolysis of the abdominal aortic plexus, part of the inferior mesenteric plexus in addition to neurolysis of the celiac plexus resulting in much better pain relief with no serious complications. As the SMA origin is slightly away from the gastric wall, it is necessary to insert the needle deeper and therefore the authors used 25-gauge needles as they are thinner and more flexible than a 22- or 19-gauge needle and thus provide greater safety and flexibility during insertion. However, injecting alcohol solution through a 25-gauge needle that has been inserted deep is technically difficult as stronger resistance is encountered upon injection in comparison to EUS CPN using 19, 20 or 22 gauge needle. In summary, EUS-BPN using a 25-gauge needle appears to be more effective than standard EUS-CPN for relieving abdominal pain in patients with advanced abdominal cancers as it causes neurolysis of larger number of pain transmitting ganglia. However, since this is a first study and is also not double blinded and randomized, prospective comparative and large-scale multicenter studies are needed to confirm these interesting observations.

Quantitative Endoscopic Ultrasound Elastography: An Accurate Method for the Differentiation of Solid Pancreatic Masses

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EUS provides high resolution images of the pancreas and is considered to be one of the most accurate investigations for the diagnosis of pancreatic mass lesions. However, differentiation of pancreatic masses is a diagnostic dilemma and thus requires EUS fine needle aspiration (FNA) for pathological diagnosis. EUS–FNA, although effective and safe, is technically demanding and false-negative results may be obtained in up to 20%–40% of the cases. The false negative rates increase in the presence of underlying chronic pancreatitis. There have been increasing attempts to improve the sensitivity and specificity of EUS in differentiating benign from malignant pancreatic lesions like use of contrast agents or techniques like EUS elastography. Elastography is a method for the real-time evaluation of tissue stiffness. Elastographic images are an index of tissue elasticity, which may be related to histopathological features. Elastography uses sonic and ultrasound waves to compress tissue. Tissue that is fibrotic and stiff will compress less than softer, healthy tissue. Because the malignant and chronic inflammatory tissue is usually harder than the adjacent normal tissue, by measuring the tissue strain induced by compression, we can estimate tissue hardness, which may be useful to distinguish pancreatic cancer and chronic pancreatitis compared with normal tissue. The main limitation of this technique is the use of subjective qualitative analysis of elastographic patterns (predominant color, distribution of colors, and constancy of pattern), which are subject to interobserver variation. Also, chronic pancreatitis may also have some degree of tissue stiffness similar to pancreatic cancer, which can make the differentiation between the two conditions difficult. Hence there is a need to develop techniques that help in objective quantitative measurement of tissue stiffness. In the current study, the authors used second generation quantitative EUS elastography in 86 consecutive patients with solid pancreatic masses. The size of the pancreatic masses was 3.14 ± 12.3 mm in diameter and the tumors were located in the head of the pancreas in 62 patients, in the body in 17 patients, and in the tail of the pancreas in 7 patients. Twenty patients with extrapancreatic diseases and normal pancreas were enrolled as controls to quantify the stiffness of healthy pancreas.

In this prospective study, EUS was performed by using the linear EUS probe with installed module enabling real-time elastographic evaluation and recording. For elastography, the probe was attached to the wall just exerting the pressure needed for an optimal and stable B-mode image at 7.5 MHz. The region of interest for the elastographic evaluation was selected manually to include the whole targeted lesion when possible as well as surrounding tissues. As elastographic images show rapid changing colors, a stable image for at least 5 seconds was required for quantitative analysis and final pattern definition. Two different areas (A and B) from the region of interest were selected for quantitative elastographic analysis. Area A was a representative area of the mass and included the biggest possible area of the tumor. Area B was soft (red) peripancreatic reference area outside the tumor. The quotient B/A (strain ratio) was considered as the measure of the elastographic evaluation. To limit selection bias of areas A and B, the strain ratio and the elasticity of area A were calculated by triplicate in each patient and the mean of the 3 measures was considered as the final result. A wide area of the head of the pancreas was selected as area A for elastographic evaluation in normal pancreas.

The final diagnosis in these 86 patients was: pancreatic adenocarcinoma (49), inflammatory mass (27), neuroendocrine tumor (6), pancreatic metastasis (2), pancreatic lymphoma (1) and pancreatic solid pseudopapillary tumor (1). On qualitative elastography, homogeneous green elastographic pattern was seen in all 20 healthy pancreas and in none of the pancreatic masses. Of the 27 inflammatory masses, 20 (74.1%) showed a heterogeneous green-predominant elastographic pattern, and the remaining 7 had heterogeneous blue-predominant pattern. Five of these 7 patients with inflammatory masses and blue-predominant elastographic pattern underwent surgery and malignancy was
excluded by histological analysis of the surgical specimen. A heterogeneous blue-predominant elastographic pattern was observed in all pancreatic ductal adenocarcinomas, metastatic oat-cell lung cancers, pancreatic lymphoma, and pancreatic solid pseudopapillary tumor. All 6 neuroendocrine tumors showed a homogeneous blue elastographic pattern. The overall accuracy of qualitative elastography for diagnosis of malignant lesions was 90.7%.

On measuring the quantitative elastography, the normal pancreas showed a mean strain ratio of 1.68 (95% CI, 1.59–1.78). Inflammatory masses had a higher strain ratio (mean, 3.28; 95% CI, 2.61–3.96) than healthy pancreas (p < .001), but lower than pancreatic adenocarcinoma (mean, 18.12; 95% CI, 16.03–20.21) (p < .001). Neuroendocrine tumors had the highest strain ratio (mean, 52.34; 95% CI, 33.96–70.71). Receiver operating curve analysis of strain ratio for the detection of malignancy yielded an area under the curve of 0.983 (95% CI, 0.956–1.0). The accuracy of quantitative elastography for the diagnosis of malignancy, by using a strain ratio of 6.04 as a cut-off value was 97.7%. With this cut-off value all malignant masses were classified correctly, whereas only one inflammatory mass and the solid pseudopapillary tumor wrongy were considered as malignant. A strain ratio of 15.41 or higher, which was shown by 36 of the 58 malignant tumors, was 100% specific for malignancy. Similarly, inflammatory masses showed lower elasticity values (mean, 0.23%; 95% CI, 0.17%–0.29%) than healthy pancreas (p < .001), and higher than pancreatic cancer (mean, 0.02%; 95% CI, 0.02%–0.03%) (p < .001). Endocrine tumors as a group presented the lowest elasticity value (mean, 0.01%; 95% CI, 0.01%–0.02%). Receiver operating curve analysis of mass elasticity for the detection of malignancy yielded an area under the curve of 0.975 (95% CI, 0.944–1.0). The accuracy of quantitative elastography for the diagnosis of malignancy, by using a mass elasticity value of 0.05% as a cut-off value was 95.3%. With this cut-off value, every malignant mass was detected correctly, whereas only 3 inflammatory masses and the solid pseudopapillary tumor were incorrectly considered as malignant. A mass elasticity value of 0.03% or lower, which was present in 44 of the 58 malignant masses, was 100% specific for malignancy.

Commentary

Use of elastography with EUS has helped in differentiation of various pancreatic solid masses but because of it being a qualitative elastographic analyses, it is subject to interobserver variation. There have been attempts to make the elastographic interpretation quantitative so as to decrease the interobserver variability and improve its diagnostic yield. Saftoiu et al made first attempt to make it quantitative by developing a semi quantitative, thus objective, image interpretation algorithm by using a sophisticated statistical method of artificial neural network analysis. Artificial neural network analyses consist of networks of highly interconnected computer processors called “neurons,” which are capable of performing parallel computations for data processing and knowledge representation. Saftoiu et al used postprocessing software analysis to examine the EUS elastography movies by calculating hue histograms of each individual image, data that were further subjected to an extended neural network analysis to differentiate benign from malignant patterns. They found the sensitivity, specificity, and accuracy of differentiation of benign and malignant masses to be 91.4%, 87.9%, and 89.7%, respectively. The authors in the current study have used second generation quantitative elastography for calculating elasticity and strain ratio for differentiating malignant and benign solid pancreatic masses and reported a better accuracy than the one reported by Saftoiu et al. In the current study, the authors have also shown that EUS evaluation alone was highly suggestive of malignancy in 1 of 4 cases and elastography provided only supportive information in them. But EUS findings were inconclusive in the remaining 75% of cases, in whom quantitative elastography provided valuable information suggesting the benign or malignant nature of the mass. Importantly, it is essential to remember quantitative elastography cannot be considered as an alternative to EUS FNA, but as an additional source of information supporting the FNA finding, mainly in cases of benign cytology. Also, there are some important limitation of EUS elastography like the difficulty of controlling tissue compression by the EUS transducer, the motion artifacts secondary to respiratory and heart movements, and the difficulty in excluding nearby structures with very low or very high density and stiffness from the region of interest, such as the heart, major vessels, or spine. Inspite of all this, quantitative EUS elastography appears to be a useful tool for the characterization of solid pancreatic masses and appears to have the most important clinical utility of supporting benign cytology findings and thus avoiding repeat FNA in these settings.

References


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Endothery of postoperative biliary strictures with multiple stents: results after more than 10 years of follow-up.

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Endoscopic dilation of postoperative biliary strictures (POBS) with increasing numbers of stents, was first described by this group from Rome, Italy, in 2001, with promising results after a long-term follow-up (mean 4 years).

This single-center study, report on the follow up data on the same cohort of 42 patients. These patients were followed up since 2001 till the last telephone contact with them in September 2009. All were asked to undergo liver function tests (total and direct bilirubin, aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, and gamma glutamyl transferase) and transabdominal ultrasound (US) every 6 months from the end of treatment. A telephone interview was done yearly to assess the occurrence of cholangitis and to evaluate the results of liver function tests and US. The main outcome measurement was occurrence of cholangitis and liver function test derangement during the follow-up period.

Of the 40 patients who were alive at the end of the study published in 2001, 5(12.5%) died of unrelated causes after a mean of 6.7 years (range 3-13.3 years) from the end of treatment, without further biliary symptoms. The mean follow-up time for the remaining 35 patients (87.5%) who formed the study cohort for the present study was 13.7 years (range 11.7-19.8 years; median 13.2 years). Seven patients (20%) experienced recurrent acute cholangitis after a mean of 6.8 years (range 3.1-11.7 years) from the end of treatment, and underwent ERCP. Four of these 7 patients had POBS recurrence (n=4/35, 11.4%), which was retreated endoscopically with placement of stents, and the other 3 patients had common bile duct stones (n=3/35, 8.6%) that were extracted. After endotherapy, there was no recurrence of stones or strictures over a further mean follow-up period of 7.1 years (range 2.5-12.1 years). Twenty-eight (80%) patients remained asymptomatic with normal liver function test results and abdominal US results after a mean follow-up period of 13.7 years (range 11.7-19.8 years).

The authors conclude that the results of multiple endoscopic stenting for POBS remain excellent even after a very-long-term follow-up. The stricture recurrence rate is low, and recurrences can be retreated endoscopically.

Commentary

The present study is the longest follow up of POBS managed endoscopically, and is likely to guide future treatment protocols for this condition. However, there are certain limitations of this study that must be highlighted: all procedures were done in a single tertiary center by expert endoscopists. Hence the results cannot be extrapolated to community endoscopic practice. The follow up was telephonic, and only 25 of the 35 patients (71.4%) sent their last liver function test results and/or US results. No morphologic evaluation of the stricture evaluation was done. Including a MRCP evaluation at the end of follow up period might have strengthened the conclusions.

What are the reported results of surgical bilioenteric anastomosis to treat POBS? The reported incidence of long-term stricture recurrence at the bilioenteric anastomosis ranges from 6% to 32% after a mean follow-up period of 6 years (range 4-9.5 years). Bilioenteric anastomotic strictures require reintervention, with its associated morbidity and mortality, or repeated percutaneous dilations with impairment of patients' quality of life, because of the presence of percutaneous drains for long periods (about 1 year). Results of percutaneous dilation of strictured bilioenteric anastomosis for POBS report a 67% to 80% success rate after a mean follow-up period of 3.1 years (range 2-5.2 years).

There is only one published study that has compared "standard" endoscopic treatment of POBS (2 stents, with elective trimonthly exchange for 1 year) with surgery. However, this study was retrospective and nonrandomized. Early complications were more common in the surgical group, and late complications related to stent occlusion were more common in the endotherapy group. Long-term success rates were similar in both groups, with recurrent strictureing in 17% of each group after a mean follow-up period of 4.1 years for endoscopy and 3.5 years for the surgery group.

Previously in 2001, the same authors have reported their protocol of insertion of maximum possible number of stents, at each endoscopy session. In this initial study, the records of 55 patients treated in this way were reviewed, and 45 patients were included. Of them, 42 patients completed the protocol (mean number of stents 3.2 ±1.3, range 1-6), with a mean duration of treatment of 12.1±5.3 months (range 2-24 months). Two patients died of unrelated causes during follow-up, and among the remaining 40 patients there was no recurrence of symptoms caused by relapsing biliary stricture at a mean follow-up of 48.8 months (range 2-11.3 years). Now the authors report the long term follow up for a mean period of 13.7 months, on 35 patients from the same cohort. Eighty percent of patients had excellent results. Seven patients (20%) experienced further episodes of cholangitis. The cause was recurrence of bile duct stones in 3
patients, and recurrence of biliary stricture in 4 patients. There was an 11.4% (4 of 35 patients) stricture recurrence rate after more than 6 years from the end of treatment (mean time to stricture recurrence 6.2 years, range 4.4-8.2 years). One of these patients had an incomplete initial treatment, a second patient had an initial stricture in the right posterolateral hepatic duct that had been missed, and in a third patient there was stricture recurrence in the left intrahepatic duct. All 4 patients were retreated endoscopically, and had normal liver function test results and liver US results after a mean of 6.7 year after retreatment.

Another study reported in 2001, reviewed 74 patients with POBS treated between 1981 and 1991. Two 10F stents were placed for a maximum of 12 months, with stent exchange every 3 months. Fifty-seven patients could be treated, and 47 patients could complete the protocol. Stents were eventually removed in 44 patients who were subsequently followed for a median of 9.1 years. Recurrent stenosis occurred in 9 (20%) - all within 2 years of stent removal.

The take home message from the above studies is that even in expert centers, patient selection for endoscopic treatment is critical. Of the included patients, a significant proportion will not be able to complete the required treatment protocol, and a significant number will develop early complications. These intention-to-treat figures must be considered when the long-term results of any treatment are reported. Of the approximately 80% of selected patients who complete the treatment, recurrent symptoms will develop in 20%. Unlike the Burmeister study where all recurrences were within 2 years, in the present study symptomatic recurrences occurred up to almost 12 years after their initial treatment. Hence careful long-term management is mandatory. With the above caveats, endotherapy can now be rightfully considered as the first line treatment for selected patients with POBS.

Water-assisted colonoscopy vs. standard colonoscopy

While unsedated colonoscopy is common in parts of Asia, scheduled unsedated colonoscopy is requested by only 7% of patients in United States (US), predominantly educated professionals. Most of these patients desire a quick return to work or home after their procedure, Overall, only about 1% of colonoscopies are done without sedation in the US.

Water assisted colonoscopy, warm water infusion colonoscopy, or ‘hydrocolonoscopy,’ was described by Falchuk and Griffin, in a patient with extensive diverticulosis. They propagated the use of water infusion when the endoscopist met with difficulty in intubating the sigmoid. The gentle pressure head and weight from warm water is thought to straighten the sigmoid colon, reduce spasm, and minimize the lengthening effect that is the hallmark of air insufflation. Uncontrolled data suggest that warm water infusion instead of air insufflation, during the insertion phase of unsedated colonoscopy improves patient tolerance and satisfaction.

In the October issue of Gastrointestinal Endoscopy, there are two randomized trials (RCT) of water-assisted colonoscopy vs. standard colonoscopy, from Italy and US. Both studies tested the hypothesis that water infusion during colonoscopy instead of air insufflation could increase the proportion of patients able to complete unsedated colonoscopy, improve patient tolerance, and increase willingness to repeat the procedure.

Warm water infusion versus air insufflation for unsedated colonoscopy: a randomized, controlled trial

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The first study was a RCT from a single community hospital, in Coma, Italy. It enrolled a total of 230 outpatients agreeing to start colonoscopy without premedication. Sedation and/or analgesia were administered on patient request during the procedure, if significant pain or discomfort occurred. The patients were randomly assigned to either warm water infusion (WWI), or air insufflation (AI) during the insertion phase of colonoscopy.

The main outcome measure was the percentage of patients requiring sedation/analgesia. Pain and tolerance scores were assessed at discharge by using a 100-mm visual analog scale.

One hundred sixteen patients were randomized to the WWI group and 114 to the AI group. Intention-to-treat analysis showed that the proportion of patients requesting sedation/analgesia during the procedure (main outcome measurement) was 12.9% in the WWI group and 21.9% in AI group (p=0.07). Cecal intubation rates were 94% in the WWI group and 95.6% in the AI group (p=0.57). Median (interquartile range) scores for pain were 28 (12-44) and 39 (14-54) in WWI and AI groups, respectively (p=0.05); corresponding figures for tolerance were 10 (3-18) and 14 (5-42), respectively (p=0.01). The adenoma detection rates were 25% and 40.1% for the WWI and AI groups, respectively (p=0.013).

The authors conclude that WWI instead of AI is not associated with a statistically significant decrease in the
A proof-of-principle, prospective, randomized, controlled trial demonstrating improved outcomes in scheduled unsedated colonoscopy by the water method


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In this RCT from Los Angeles, 82 veterans undergoing scheduled unsedated colonoscopy were randomized to the air (n=40) or water (n=42) method. The main outcome measurements were discomfort and procedure related outcomes. The discomfort was recorded as maximum discomfort (0=none, 10=most severe; verbal scale) reported to an unblinded assistant during colonoscopy, and overall discomfort (0=none, 10=most severe; visual analog scale) reported to a blinded observer 5 to 10 minutes after colonoscopy. The maximum discomfort was the point at which colonoscopy was discontinued at the patient’s discretion. There was no option of on-demand analgesia during the procedure. If the procedure was abandoned, it had to be rescheduled.

The authors report that the cecal intubation rate (78% vs. 98%), and willingness to repeat the procedure (78% vs. 93%) were significantly better with the water method (p=0.05). The mean score for maximum discomfort was 5.5±3.0 vs. 3.6±2.1 (p =0.002), and the median overall discomfort score after colonoscopy was 3 vs. 2 (p =0.052), with the air and water method, respectively. The colonoscopy method, but not patient characteristics, was a predictor of discomfort. The odds ratio for failed cecal intubation was 2.09 (95% CI, 1.49-2.93) for the air group. In contrast to the previous study, the water method numerically increased adenoma yield.

The authors conclude that the water method significantly enhanced cecal intubation rates, willingness to undergo a repeat colonoscopy, with a significant decrease in maximum discomfort.

Commentary

Water assisted colonoscopy has the potential advantages of a lower incidence of cardiorespiratory adverse events, no restriction on patient activity after the procedure, and lower procedure costs. However, colonoscopy done without any sedation may be painful and poorly tolerated by patients, and may be associated with a worsening of technical performance outcomes.

The procedures in the Italian study were done by one of three staff gastroenterologists. The study was started after a 1-month training period during which all 3 endoscopists performed approximately 30 colonoscopies with water instillation, without air insufflation. A senna-based preparation was given, consisting in a low-residue diet for 2 days before and high-dose senna (24 tablets in 2 divided doses) on the day before the procedure.

For patients randomized to the water instillation group, a liquid reservoir was filled with water at 37°C temperature before starting the colonoscopy; warm water was intermittently infused by means of a peristaltic flushing pump (Olympus OFP; Olympus Corp) through an auxiliary water channel of the colonoscope to obtain lumen distention. There was no restriction of the overall volume of water that could be infused. If the endoscopist judged it unsafe to advance the colonoscope, air was briefly (lasting no more than 10 seconds) turned on. If 3 or more episodes of air insufflation were needed, the outcome was recorded as failure. Patient pain and tolerance were assessed at discharge, by means of a validated visual analog scale. The procedure tolerance and the willingness to repeat the colonoscopy under the same circumstances were assessed at discharge, and again at 24 hours by a telephonic interview.

The study found that the use of water instillation instead of air insufflation during the insertion phase improves the overall tolerability of the examination, although it does not significantly decrease the proportion of patients requiring on-demand sedation during the procedure. The use of water infusion does not seem to increase the difficulty of the procedures, although it is associated with a significantly longer time to reach the cecum. For the water method, residual stool mixed with infused water could impair visibility. Suction of dirty water followed by infusion of clean water restored visibility. The authors of the US study state that their global impression was that after the water was removed by suction, the colons were “much cleaner” than those examined by the air method. The “dirty water” was suctioned and replaced by clean water. As a downside, some patients did pass the water per anus as a bolus, requiring several large towels to soak up.

There was a lower adenoma detection rate with water instillation in the Italian study, unlike the US study, which reported an increased adenoma detection rate. Leung speculate that the turbulence produced by simultaneous aspiration and infusion loosened the adherent feces, and the
cleansing effect might have contributed to the higher adenoma yield in their study.

In the Italian Radaelli study, the main outcome was whether the use of warm water infusion during insertion reduced the proportion of patients requiring on-demand sedation. On the other hand, in the Leung study, there was no sedation backup. Potential subjects with a previous “tough” experience with colonoscopy might not have signed up after being informed of the study methodology. Also the potential need for repeat bowel preparation and repeat colonoscopy might have coerced some subjects to “put up with” excessive discomfort.

The Leung study reports that not only was the cecal intubation rate higher with the water method, but also that the water method provided “salvage” cecal intubation in 3 subjects after failure because of discomfort with the air method. Interestingly, the air method with sedation did not alter the failed outcome in the 1 subject in the water group caused by obstruction.

While the above two studies establish the role of water instillation as an alternate and better tolerated method of colonoscopy, before these conclusions can be extrapolated to Indian patients, cultural and practice differences mandate that the beneficial effects of the water method must be confirmed by RCTs in our country.

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