

EXPERT'S CORNER

The Most Important Maneuver During Colonoscopy

Jerome D. Waye, M.D.

Mount Sinai School of Medicine, Mount Sinai Hospital, New York City, New York

Colonoscopy would be quite acceptable to most people if there were no pain during the examination. Some physicians have turned to anesthesiologists to achieve this goal, while others, using endoscopist-administered sedation and analgesia, rely on technical expertise to get the patient through the procedure with an acceptable level of comfort. Although some centers have developed endoscopist-controlled propofol anesthesia, this is not yet a generally accepted technique (1).

The cause of visceral pain is mainly due to the stretch of the mesenteric attachments, with a lesser component related to the pressure of air distention (2). Using a magnetic imager, it has been shown that most of the patient discomfort occurs when the colonoscope tip is in the sigmoid colon and coincides with either looping or pulling back the shaft (3).

It is my opinion that straightening of the shaft is the single most important technique in instrument passage. Using repeated shortening attempts with pleating of the colon on the instrument, the cecum can frequently be reached with the total length of inserted shaft at 60 cm from the anal verge. However, a considerably longer colonoscope than 60 cm is invariably necessary to get the instrument to the cecum in that shortened position. Often, 100 to 130 cm of shaft are used during intubation because each advance is accompanied by sigmoid loop formation.

Because of the multiple bends, folds, and twists of the large bowel, it is inevitable that the instrument will loop and coil during intubation. This can, to a great extent, be corrected by pulling back and restraightening the shaft after each advance of the instrument. Endoscopists who have difficulty in intubation of the right colon or passing the instrument around the hepatic flexure are almost invariably stymied because they have not straightened out the loops in the colonoscope, which are on the left side of the colon, before attempting further intubation.

The sigmoid mesocolon always induces a clockwise spiral in the shaft of the instrument as it traverses this segment. The scope advances from the anus to the descending colon by progressing in a fashion similar to that of a coiled spring, spiraling in a clockwise forward direction as if inserting a screw. As the shaft is pushed into the rectum, part of the forward energy is involved in advancing the instrument, but part of the energy is directed toward the obligatory spiral path determined by the mesenteric attachments of the sigmoid. There invariably comes a moment when the obligatory

loop becomes large and the patient begins to complain of pain. The pain, due to stretching of the sigmoid mesentery by the loop, can be alleviated by withdrawing the instrument. Withdrawal of the shaft results in three important beneficial effects: straightening the scope, pleating the colon onto the shaft, and disimpaction of the tip from direct mucosal contact. Because of the repeated tendency for the mesocolon to cause a loop in the shaft, after every few centimeters of tip advance it is wise to torque the instrument slightly clockwise and withdraw the shaft several centimeters to straighten the instrument and pleat the bowel. During the controlled clockwise withdrawal of the shaft, the tip may actually advance along the course of the colon due to the removal of the loop. If the loop is not completely removed, then reintroduction of the shaft will invariably reform the loop, causing the same problems previously described.

An unimpeded view of the lumen should not be taken as an invariable signal to push the instrument forward, since the unseen (and unknown) loops in the shaft of the lumen may merely enlarge in diameter and cause abdominal pain without forward motion of the instrument tip.

It is common that during intubation, insertion of 60 cm of the shaft may occur with the tip not advanced beyond the midsigmoid colon and a large, painful loop rises out of the pelvis. This often happens because of the struggle to move the tip to the left, or to the right, torquing and twisting and pushing around multiple angulations. The looping can only be corrected, and the pain resolved, by controlled shaft withdrawal.

The question always arises as to how far should the shaft be withdrawn during removal of a loop. There are two criteria that may be useful in this determination. The first is to withdraw the instrument sufficiently so that there is no longer any tactile sensation of "tension" on the instrument; rotation of the shaft will then cause the tip to rotate in an arc that corresponds to the rotatory motion of the instrument. Second, if a difficult passage around several folds is encountered, but further progress is impossible, an attempt should be made at withdrawal of the instrument to the point where one of the difficult folds is encountered. If further withdrawal results in retrograde movement of the tip beyond that fold, it may once again be difficult to regain that position. When this point is reached and the scope cannot be further withdrawn because of the risk of unraveling several centimeters of bowel which were pleated on the scope, withdrawal should be stopped. When that fold which was difficult to intubate is seen, but

there is still “tension” felt on the instrument and it does not move freely, the instrument must then be readvanced in an attempt to reach the next bend of the colon, where the tip can be deflected around that bend and the withdrawal maneuver once again performed.

When the instrument is withdrawn into a straight configuration using clockwise torque, there is almost invariably a loop formed by the instrument shaft outside the patient. This outside loop should be removed by de-rotating the shaft while maintaining a luminal view. Once straightened, further advancement of the instrument is usually easy, since most of the forward energy will be directed along the shaft of the scope to the tip. Because of the mesenteric attachments, there is always a tendency for the loop to reform in the sigmoid colon. Repeated de-rotation sequences will assist in forward progress of the colonoscope.

Maintenance of a straight instrument requires continued and repeated attempts at withdrawal and loop removal. These maneuvers are especially important in intubation of a fixed and tortuous sigmoid colon. Loops in the shaft (usually in the sigmoid colon) cause patient discomfort, but pulling back and straightening the instrument will decrease pain, and allow the shaft to be further inserted with minimum discomfort. It is difficult to remove loops in the sigmoid colon when the tip is in the right colon, and a useful rule is that loops should be removed and the scope straightened when the tip is at the splenic flexure before further advancement. Straightening the shaft is the most important maneuver during colonoscopy. Efforts to maintain a straight scope will make the examination easier

for both the patient and the endoscopist, and will increase patient satisfaction without the need for increasing the dose of medication.

Propofol, sometimes called “the milk of amnesia” renders the patient totally unconscious, and when carefully administered does not result in respiratory collapse. However, this option often requires an anesthetist or a trained nurse, but there is a potential for the drug to produce sudden and severe respiratory depression. The requirement of a second physician (anesthetist) during routine colonoscopic examinations results in a marked increase in the health-care payment expense. Use of the straight scope technique with sedation/analgesia provided by the endoscopist will result in an acceptable level of comfort for the vast majority of colonoscopic examinations. It is the wise colonoscopist that pulls back the shaft as often as it is pushed in.

Reprint requests and correspondence: Jerome D. Waye, M.D., 650 Park Avenue, NY, NY 10021.

REFERENCES

1. Chen SC, Rex DK. Review article: Registered nurse-administered propofol sedation for endoscopy. *Aliment Pharmacol Therap* 2004;19:147–55.
2. Waye JD. The best way to painless colonoscopy. *Endoscopy* 2002;34:489–91.
3. Shah S, Brooker J, Thapar C, et al. Patient pain during colonoscopy: An analysis using real-time magnetic endoscopic imaging. *Endoscopy* 2002;34:435–40.