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Safe and Effective Abdominal Pressure During Colonoscopy

Forearm Versus Open Hand Technique

ABSTRACT

Safe and effective colonoscopies may depend on several factors. The technique of the physician, effectiveness of the preparation, and the patient's previous surgeries are key factors in providing a complete colonoscopy. However, a very important aspect of providing a safe and effective colonoscopy for the patient is not only the physician's expertise, but also abdominal pressure techniques that can be provided by the assistant. These techniques, which have not been widely publicized until the last few years, will assist in anus-to-cecum surveillance of the colon. It is important to recognize that proper technique is vital to prevent injury to both the patient and the assistant providing the pressure. In this article, three techniques are discussed; however, only two are recommended. One technique (open hand) is noted as a technique that

may have the potential to cause injury to the assistant. Effective and safe abdominal pressure will aid in the comfort of the patient and may shorten the time it takes to complete the procedure.

The ability to provide abdominal pressure is a very important part of colonoscopy. The objective of a colonoscopy is obviously to reach the cecum. Often, if the physician is unable to reach the cecum, the patient is required to undergo another round of prep and procedure. The assistant's ability to provide effective and safe abdominal pressure during colonoscopy is critical in assisting the physician reach the cecum, thereby saving the patient from another procedure.

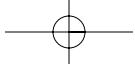
This article will highlight several methods to apply abdominal pressure during a colonoscopy while the patient is placed on his left side. When asked to give pressure, the assistant should always know at what point the scope is located in the colon. Effective pressure cannot be given without this knowledge. If a loop has developed, the physician should reduce the loop to allow the assistant to provide pressure and allow the scope to move forward. As a result, the patient will have less discomfort. A good place to start giving pressure is in the sigmoid area (a known common place for a loop to form) and then work your way around the colon if sigmoid pressure is not effective. Remember—the purpose is to try to coax the scope around the colon. If the scope is progressing through the colon, effective pressure is being provided. If the scope is not moving, the assistant may need to reposition the hand placement and have the physician continue trying to advance the scope.

Received January 12, 2008; accepted May 5, 2008.

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Techniques

Of the three techniques described below, the first has often been used by assistants in the past and can result in injury to the wrist; therefore, it is not recommended. The second and third techniques described are new and safer techniques for the assistant and the patient. Obviously, providing safe as well as effective abdominal pressure is important. There will be sustained postures or positions for the duration needed to provide appropriate pressures during the colonoscopy. The person applying these pressures must be familiar with the various techniques and how to use these most effectively to protect himself or herself as well as the patient. Each of us needs to know our most effective muscle actions and our body positioning along with patient positioning to assist us with applying pressures correctly and safely. It is important to discuss the process as a team and work out compromise and consensus on patient positioning, how the table height is set, whether others will be available to assist with pressure, where everyone will stand, duration of pressure before a moment of release is needed, what are appropriate forces for pressure applied, whether an additional monitor can be available (if needed), and an appropriate height step stool (if needed).

Scenario 1: Open Hand Technique—Not Recommended, Illustrative Use Only (Figures 1 and 2)

With the patient positioned on his left side, the physician requests abdominal pressure. Using the palm of the left hand, the fifth finger is placed parallel to the pelvic bone with the fingers spread so that the assistant covers as much area as possible. Using the right hand, the assistant then grasps the patient's gown by

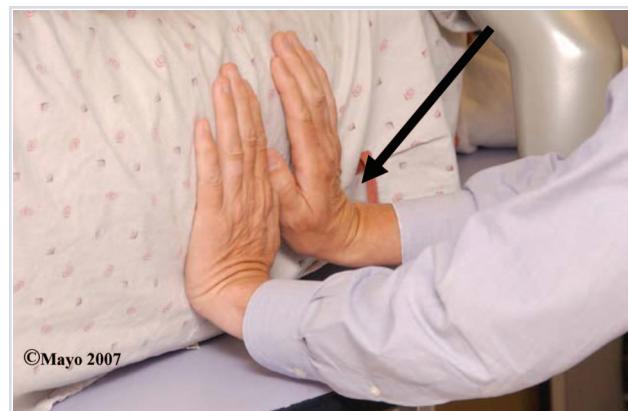


FIGURE 2. Open hand technique: Technician covering the sigmoid and splenic flexure of the colon. Not recommended because of possibility of injury to technician's wrists (arrow indicates location of possible injury to technician). By permission of Mayo Foundation for Medical Education and Research. All rights reserved.

the right shoulder and pulls the patient onto the left hand. This technique will cover only the sigmoid area. If more pressure is required, place the right hand with fingers pointing up just under the diaphragm and, again keeping the fingers widespread, press into the patient. Pressure will then be given to the sigmoid and splenic flexure. This technique will be more effective if there is another technician or nurse in the room to provide counter pressure by pushing the patient onto the assistant's hands. The consequence of this technique is the very real possibility of injuring the assistant's wrists.

Scenario 2: Single Forearm Technique (“Prechel Pressure”) (Figure 3)

With the patient on his left side, place the left hand (palm down, fingers extended, knuckles down, or in a fisted



FIGURE 1. Open hand technique: Technician covering only the sigmoid portion of the colon (arrow indicates location of possible injury to technician). By permission of Mayo Foundation for Medical Education and Research. All rights reserved.



FIGURE 3. Recommended technique using “Prechel pressure” covering sigmoid and midline segments of the colon. By permission of Mayo Foundation for Medical Education and Research. All rights reserved.

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position) under the patient in the area of the sigmoid. Push the left hand under the patient so that the whole hand is positioned just above the pelvic bone. The assistant rolls his forearm into the patient. The right hand can be used to pull the patient's gown (right shoulder) and roll the patient onto the assistant's forearm. By doing this, pressure will be provided in the sigmoid and midline of the abdomen. During this approach, the patient's weight on the assistant's forearm actually applies the pressure. The forearm is merely acting as a splint (Prechel, Young, Hucke, Young-Fadok, & Fleischer, 2005).

Scenario 3: Two-Forearm Technique With Counter Pressure (Figure 4)

The patient is still on his left side. It becomes evident that more pressure needs to be given in a broader area to move the scope forward. At this point, it becomes necessary for the assistant to use both forearms to provide pressure. With the left forearm in the position previously referenced in Scenario 2, the assistant then places his right hand under the patient (fingers extended, knuckles down, or fisted) just under the splenic flexure and below the diaphragm. To be effective with this technique, it is necessary to have another technician or nurse apply counter pressure by pushing on the patient's right shoulder blade and right hip bone, thereby rolling the patient onto the assistant's forearms. The person providing counter pressure should be especially careful to avoid the patient's spinal column. By using this technique, pressure will be given to the sigmoid, midline, splenic flexure, and midtransverse colon. Again, the forearms will be acting as a splint with the patient's own body weight actually applying the pressure (Prechel et al., 2005).



FIGURE 4. Recommended two-forearm technique covering the sigmoid, midline, splenic flexure, and midtransverse colon. This technique also requires counter pressure. By permission of Mayo Foundation for Medical Education and Research. All rights reserved.

Ergonomics

During colonoscopy, the table or bed height will usually be at the height for the physician completing the examination. When pressure is needed to assist with movement of the scope or looping, the assistant applying pressure needs to be able to stand in a posture that allows the body to assist with the technique. This maintains the back in a neutral spine posture and allows the knees and hips at least a slight bend to be more fluid in the stance. If the elbow height is more than 3-6 inches above the table height, then this person will need to use a stance of one foot forward or spread the feet apart to reduce the height over the patient. If lower than this, add a footstool. Remember, these pressures are considered light with the exception of the obese patient.

The patient needs to be positioned within 10-20 inches of the person applying pressure to the abdomen. This will allow the arms to be in a more effective posture with the whole body more involved, not just the arms and back. Be mindful of the back posture by reducing forward reaching distance (Prechel et al., 2005).

During the aforementioned forearm techniques, the patient's weight should rest more on the forearms, not all on the wrists and the hands. The assistant performing these techniques should be at a height that allows the forearm to push in slightly while pulling the patient forward with the opposite arm or pushed onto the forearms when assisted by another staff. With these techniques, the hands act more as an anchor with the pressure against the patient being primarily on the forearms. Become familiar with the various hand positions and determine which one is most effective for a given technique, protection of the wrists and the hands, and individual strengths.

Most pressures, when applied with good body mechanics and positioning, should be sufficient for 3-5 minutes. If needing to apply pressure for longer periods, communicate in advance a signal to provide a moment to relax the pressure. Should the arms become tired or sore, trade with another to become the person directing the patient's weight onto the forearms.

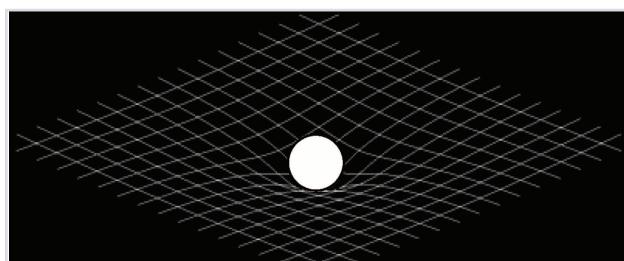
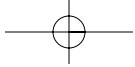


FIGURE 5. Illustration indicates how pinpoint pressure by use of elbows and fists may cause injury to the patient as pressure is given in a small, precise location. By permission of Mayo Foundation for Medical Education and Research. All rights reserved.



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Remember, we are not all the same heights, arm lengths, and muscle strengths. Work with the various techniques described to develop the postures and positions that are most effective for splinting the scope, reducing looping, providing comfort to the patient, and protecting ourselves.

Patient Injury Prevention and Comfort

The concept of applying pressure to the abdomen during a colonoscopy is to provide pressure around the area of the scope to assist with moving it along the path of the colon and decrease looping with the colon. It is important to think about the size of the “scope head” and how to provide “splinting” around the scope to help direct the movement. For the comfort of the patient and protecting sensitive soft tissue, it is important to remind ourselves of point of pressure increasing with a smaller surface area being pushed against. A colonoscopy is not about reducing/relaxing muscle trigger points. Splinting to assist with reducing the looping requires applying pressure over as broad an area as possible to stabilize tissue around the scope along with downward pressure against the abdomen. With possibly the exception of patients with large girth or adipose tissue, these pressures do not need to be exceptionally forceful. The duration of the pressure applied will be determined by the speed of the procedure.

Although there is no documentation in the current literature regarding injuries to either the patient or the assistant by use of pinpoint pressure (i.e., use of elbows and fists) when asked to provide abdominal pressure during colonoscopy, discussion with individuals at various national meetings over the past several years has brought to our attention that there is a possibility of bruising the patient when such maneuvers are done.

It is a well-known fact that by applying pressure in a precise location, pinpoint force is being directed to a precise focal point (Figure 5). When pressure is given on broad spectrum, the pressure is being displaced evenly.

For anyone who has worked around wound care related to pressure sores, the idea of localized, prolonged pressure and the effects are well understood. The point of this is not that colonoscopy pressures are applied for long duration but that discomfort and injury to the patient is a very real possibility when pressure is applied using fingertips, elbows, or fists. There may be less assistance in loop reduction and direction of motion with these smaller pressure areas due to the flexibility of the colon and layers being pressed against the abdomen.

Conclusion

Several key factors are crucial to keep in mind when applying abdominal pressure during colonoscopy: (1) the assistant should always be aware of the amount of pressure being exerted so as to not injure himself or herself or the patient; (2) the open hand technique leaves the assistant vulnerable to possible injury to the wrist; (3) good body mechanics and positioning should be used to ensure optimal comfort for the assistant; and (4) using the forearm techniques allows the assistant to provide effective and safe abdominal pressure, thereby reducing the risk of injury. ☀

REFERENCE

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