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REVIEW

The use of abdominal massage to treat chronic constipation

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KEYWORDS
Bowel stasis;
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Self-massage;
Transit-time

Summary Constipation is a disorder of gastrointestinal motility characterized by difficult or decreased bowel movements, and is a common condition in Western countries. Laxatives are the most common strategy for managing constipation. However, long-term use of some laxatives may be associated with harmful side-effects including increased constipation and fecal impaction. Abdominal massage, once an accepted method of treating constipation, is no longer standard of care, but may be a desirable therapy for this condition because it is inexpensive, non-invasive, free of harmful side-effects, and can be performed by patients themselves. However, until recently, evidence for its effectiveness was not strong enough to make a recommendation for its use in constipated patients.

In 1999, Ernst reviewed all available controlled clinical trials, and found that there was no sound evidence for the effectiveness of abdominal massage in the treatment of chronic constipation. This article reviews scientific evidence from 1999 to the present, regarding abdominal massage as an intervention for chronic constipation. Since that time, studies have demonstrated that abdominal massage can stimulate peristalsis, decrease colonic transit time, increase the frequency of bowel movements in constipated patients, and decrease the feelings of discomfort and pain that accompany it. There is also good evidence that massage can stimulate peristalsis in patients with post-surgical ileus. Individual case reports show that massage has been effective for patients with constipation due to a variety of diagnosed physiologic abnormalities, as well as in patients with long-term functional constipation.

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Introduction

Constipation is a disorder of gastrointestinal motility characterized by difficult or decreased bowel movements (less than three times a week). When the digestive system is functioning optimally, food is eaten and digested, and then the residue is excreted, usually within 20—56 h (see Figures 1 and 2) (Liu et al.,, 2005; Southwell et al., 2009) Constipation may be brought on by a change in diet, medication, a change in daily routine, abdominal surgery or acute emotional stress. Longer-lasting constipation, however, generally occurs when disease, poor diet, muscle spasticity, physical obstructions, sluggish contractions, or other factors cause stool to move through the colon at a slower-than-normal pace, until by the time it reaches the end of the large intestine it has lost a great deal of water and has become hard, dry, and difficult to eliminate (Leung, 2007; Locke et al., 2000).

Constipation affects about 9% of children, and between 12 and 19 percent of all adults. (Shan et al., 2008; Van de Berg et al., 2006; Wald et al., 2008).

In the United Kingdom 10% of the general population, 20% of elderly living at home, 49% of those in long-term care, and 70% of persons with learning disabilities have chronic constipation. English citizens spend 67 million pounds on laxatives each year (Johanson et al., 2007; Emly and Rochester, 2006; Addison et al., 2003). In the United States and Canada, chronic constipation affects

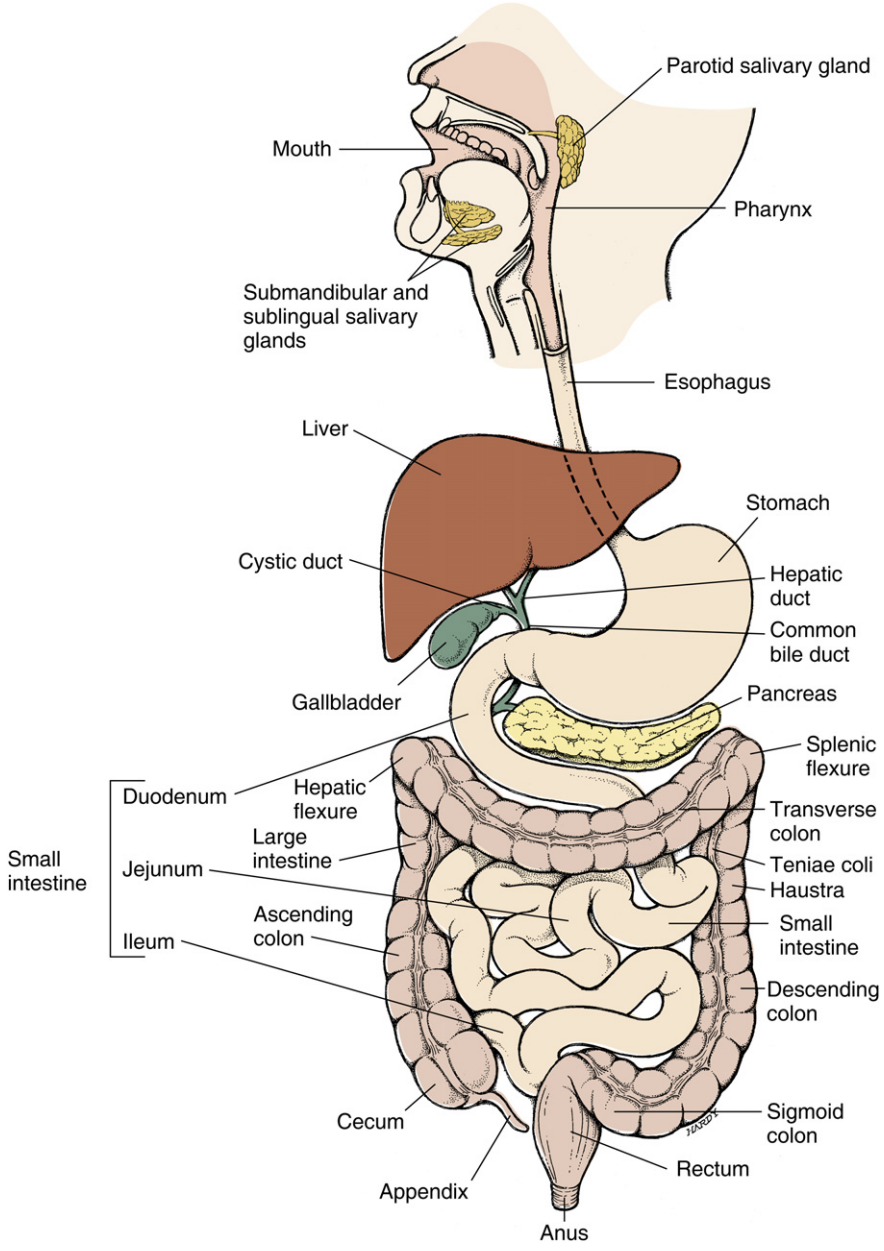

Figure 1 "Structures of the Digestive System", reprinted with permission from Stedman's Medical Dictionary, 27th edition, Baltimore: Lippincott, Williams and Wilkins, 2000.

Figure 2 "Retained Feces in Colon of Patient with Functional Constipation", reprinted with permission from Federle, M., Diagnostic Imaging Abdomen, AMIRSYS Inc., Salt Lake City Utah, 2007.

about 15% of the population, and American citizens spend 725 million dollars on laxatives each year (Higgins, 2004; Shan et al., 2008). In a survey of 13,879 adults from 7 countries, an average of 12.3% of adults were constipated, with a higher percentage occurring in women and seniors (Wald, 2008). Women are especially likely to become chronically constipated (Rao, 2008, 2009, Davies et al., 2009; Higgins, 2004; Talley, 2004; Van de Berg et al., 2006; Wald, 2008; Johnson, 1989). Even those who have a bowel movement every day may have hidden constipation, that is, feces remaining in any of the three divisions of the colon or in the rectum itself (Raahave et al., 2004).

Current allopathic treatment of constipation includes dietary changes (especially an increase in the consumption of fiber and water), attention to habits/urge to defecate, physical exercise, enemas, bulk-forming, osmotic or stimulant laxatives, and stool softeners. Biofeedback training may be used for patients with constipation caused by poor rectoanal coordination (Rao, 2008). Surgical treatment may be used as a last resort.

Naturopathic medicine views constipation as having one of three primary causes, atonic (due to dilated or ptosed intestines, loose rectal muscles, or inactivity), spastic (due to irritation caused by food, medicines, parasites or emotional stress) or obstructive (due to adhesions from surgery or infection). Treatment includes nutrition (including dietary changes, probiotics, digestive enzymes and dietary supplements), internal and external hydrotherapy, botanical and homeopathic medicines and manual therapies such as massage and visceral manipulation (Mariotti, 2009). Colon hydrotherapy may be employed as a method of stretching the muscles and fascia of the colon from within (Dorman, 2006).

From the late 1800's through the 1950's, in both Europe and the United States, Swedish massage, using petrissage, effleurage, vibration and tapotement strokes applied to the anterior abdominal wall, was a widely used treatment for constipation (Kleen, 1921; Kellogg, 1923; Starr, 1903; Whorton, 2000) (Oriental styles of bodywork have long used abdominal techniques to reduce constipation) (Chia, 1991; Matsumoto and Birch, 1998; Marin, 1999). Practitioners believed that by applying pressure to the anterior abdominal wall, they were compressing the digestive organs between the massaging fingers and the posterior wall of the abdominal cavity and stimulating peristalsis. Some, but not all, believed massage also propelled feces through the intestines towards the rectum (Kellogg, 1923). Some practitioners targeted massage to the large intestine so specifically, that one prominent physician recommended the abdomen of the constipated patient be X-Rayed prior to massage to identify the colon's exact location (Kellogg, 1923). Abdominal massage may have inadvertently treated scar tissue or trigger points in the muscles of the midabdomen, either of which can cause excess gas and sensations of abdominal swelling and fullness, and some patients may have confused relief of their symptoms with a reduction in constipation (Travell et al., 1999). Professionals in the field of massage therapy continue to recommend abdominal massage for constipation (Fernandez, 2006; Sinclair, 2004).

Literature search

Observational studies and case reports comprise most of the evidence for the effectiveness of abdominal massage as a treatment for constipation. In 1999, a systematic review of evidence by Ernst examined observational studies, case reports and four controlled clinical trials. Ernst concluded that all four clinical trials had methodological flaws. Only one was randomized, and one trial consisted of only one patient. In addition, they were not consistent in terms of the trial design, the type of massage that was given, or the type of patients that were in the trials. Therefore, he found that there was no sound scientific evidence regarding the effectiveness of abdominal massage in the treatment of chronic constipation. Looked at collectively, however, the trials showed enough positive results, such as decreased constipation and improved patient well-being, that more rigorous trials — randomized, controlled, and with larger numbers of patients — were warranted (Ernst, 1999).

Since the appearance of Ernst's paper, there have been further observational studies with specific populations: two with spinal cord injured patients (Albers et al., 2006; Ayas et al., 2006) and one each with groups of post-stroke patients (Jeon and Jung, 2005), elderly patients (Kim et al., 2005), hospice patients (Preece, 2002) and profoundly disabled group-home residents (Emly, 2001). In each case, abdominal massage decreased constipation and associated abdominal discomfort. For example, Ayas et al found that 15 min of abdominal massage per day decreased colonic transit time, abdominal distention, and fecal incontinence, and increased frequency of defecation in 24 spinal cord injured patients (Ayas et al., 2006). Emly's

study took place at a group home for profoundly disabled adults, all of whom had been taking laxatives for extended periods of time. At the beginning of the study, all laxatives were withdrawn and daily abdominal massage using moderate-pressure effleurage, kneading and vibration was given instead. Subjects were assessed after eighteen months and not only were they no more constipated than when using laxatives, in some cases there was marked improvement in digestive function (Emly, 2001).

Four individual case reports have also appeared since 1999, where abdominal massage effectively decreased constipation. These individuals were a 64 year-old woman with myelopathy (HAM/TSP, a spinal cord inflammation with effects similar to those of a traumatic spinal cord injury), an 8-year-old boy with lifelong constipation, a severely constipated female patient in her mid-eighties with abdominal muscle weakness, and a 31-year-old male in the acute phase of Guillan-Barre syndrome (Liu et al., 2005; Quist, 2007; Harrington and Haskvitz, 2006, and Shirreffs, 2001) (footnote: Acute Guillain-Barre presents with polyneuritis, which leads to weakness of the muscles of the digestive tract, sluggish contractions and constipation). There were many variations in the observational studies and case reports, such as the specific massage technique, how it was applied, and for how long. None were randomized, controlled trials.

In 2009 Lamas carried out a randomized, controlled trial on the use of abdominal massage with sixty elderly patients. All subjects had functional constipation which had been treated with laxatives for several years. Patients were divided into a control and an intervention group, both of which continued to take laxatives during the study period. The intervention group received 32 massages over a period of 8 weeks. Each session began with 8 min of hand massage to help patients relax, followed by 7 min of abdominal massage. The massage technique was based upon the Tactile Stimulation Method of Birkestad which consists primarily of palm-to-skin stroking, gentle pressing, and static touch, all using very light pressure (Birkestad, 1999). For Lamas' study, it consisted of light-pressure longitudinal and transverse strokes over the abdomen, and clockwise circular movements over the presumed course of the colon. Using a gastrointestinal function questionnaire, subjects were assessed before the study began, after the fourth week, and then after the eighth week, the end of the study. No significant differences were found after 4 weeks. At 8 weeks, however, the massage group had significantly less constipation, less abdominal pain, and more bowel movements than the control group. Researchers also found that the more constipated the patients were at the beginning of the study, the greater the improvement in their symptoms (Lamas et al., 2009).

Another randomized controlled study investigated the effectiveness of mechanical abdominal "massage" upon the peristalsis of patients who had had colon surgery one day before. Peristalsis normally slows or stops altogether after colon surgery, but use of a machine which applied intermittent pressure to the abdomen significantly decreased the time to first passage of flatus after surgery for the mechanical massage group versus a control group (Le Blanc-Louvry et al., 2002).

Anatomy and pathophysiology

The abdominal viscera lie directly beneath the muscles of the anterior abdominal wall. Longitudinal and circularly arranged smooth muscle, with sensory neurons and nerve endings lying within it, make up the walls of the stomach, small intestine and colon. The vagus nerve innervates most of the digestive tract, and parts not innervated by the vagus are innervated by pelvic nerves from the sacral region of the spinal cord. The vagus can be impinged as it passes through the jugular foramen or at the cranial base, possibly affecting visceral function (Joyce and Clark, 1996).

There may be trigger points in the intestinal muscles themselves: when stimulated with an inflatable balloon trigger areas in the esophagus, small intestine and colon can reproduce patients' abdominal pain (Moriarty and Dawson, 1982; Travell et al., 1999). It is unknown if there is a relationship between these trigger points and constipation.

Digestion is a complex process requiring the co-ordinated interaction of mechanical, chemical, neurological and hormonal elements. Except at the mouth and anus, digestion is performed entirely by smooth muscles, whose actions include churning, kneading and propulsion of chyme, reflex emptying of the colon (the gastrocolic reflex), and rectal compliance. Efficient movement of contents through the system has a great deal to do with the sensory neurons and nerve endings that sense distortion, pinching, contraction and distention of the gut wall. When a segment of smooth muscle is distended with approximately 2 mm Hg of pressure, stretch receptors of the afferent neurons located in the lumen wall are activated and contraction occurs of both longitudinal and circular muscles. The circular muscles create a ring around the lumen. At the same time, a few centimeters above the higher pressure area, intestinal wall muscles contract, while below the point of stimulus, the muscles relax. Thus pressure is created on chyme, pushing it forward and bulging or stretching the next segment of intestinal wall muscle in turn, which stimulates yet another contraction and creates a peristaltic wave. Most contractions involve only 1–4 cm of bowel before they die out, thus peristaltic contractions move the contents of the intestines along at about 1 cm per minute. Not only large amounts of chyme, but lumps of food, artificial objects, intestinal parasites and tension in the muscles themselves can stimulate contractions, while very small stools (typical of patients on low-fiber diets) fail to distend the lumen sufficiently to stimulate peristalsis. Artificial distention or stimulation of the intestinal walls by enemas, digital stimulation, medical procedures and temperature extremes can also stimulate muscle contractions (Lippincott's, 2008; King et al., 1986). In anesthesized dogs, gentle stroking or touching of the mucosal (or inner) surface of the small intestines stimulated contractions which lasted 30 s to 1 min (Neya, 1993). Mechanical stretch of segments of isolated guinea pig intestine causes a contraction of the intestinal muscle (Brookes et al., 2004).

When the intestinal wall just proximal to a sphincter becomes distended, the sphincter relaxes briefly, during which time chyme is propelled through it. Simultaneously,

the muscles just distal to the chyme relax: chyme is thus moved forward, while sphincters contract again to prevent backflow.

In the colon, muscle contractions squeeze, compact and propel chyme, squeezing out water in the process and forming the remaining paste into stool. Slow transit of stool may occur at any point throughout the colon, and in only one or two segments rather than all three (van der Sijp et al., 1993). Spasm of colonic muscles may occur with some illnesses such as pneumonia or myocardial infarction (Barral, 2005) Most of the actual propulsion of stool happens when mass movements (large waves of peristaltic action) occur, 1—4 times daily, generally just after eating a meal (see Figure 3). At this time, a massive contraction of the cecum and colon, creating pressures as high as 100 mg Hg, moves part of the contents in the cecum up the ascending colon, into the transverse colon and then down into the descending colon and rectum. The contraction lasts 1—4 min before it decreases and then finally stops altogether. Finally, more contractions move the now-formed stool into the rectum (These muscle contractions can empty the bowel as high up as the splenic flexure). The peristaltic action of the sigmoid colon and distention of its distal end stimulate contraction of the large muscles of the rectum, thereby increasing rectal pressure and stimulating relaxation of the internal and external sphincters. Abdominal wall muscles, which normally are voluntarily contracted to increase intra-abdominal pressure during a bowel movement, also enhance defecation by applying inward and downward pressure on

Text box 1. Factors that interfere with the timely movement of abdominal contents through the digestive system

More than one factor may be present in the same patient.

- Lifestyle-related factors such as a diet that is low in fiber, regularly ignoring the urge to defecate, and chronic dehydration (Older people may drink less in an attempt to control incontinence). Another factor, low muscle tone due to inactivity, slows gastrointestinal transit time (Cordain, 1986; Oettle, 1991; Peters et al., 2001; Petticrew et al., 2001; Davies et al., 2009; De Oliveira and Burrini, 2009).
- Aging-related changes including the loss of enteric neurons and increased susceptibility to the adverse effects of medications.
- Long-term use of stimulant laxatives, which can result in decreased bowel contractions and increased constipation (Petticrew et al., 2001).
- Dysfunction in the pelvic floor muscles secondary to childbirth or hysterectomy, resulting in an immobile perineum and decreased descent of the pelvic floor during defecation (Rao, 1998) The longitudinal coat of muscle of the distal colon, which becomes complete in the sigmoid colon and rectum, is continuous with perineal muscle and fascia.
- Medical conditions such as hypothyroidism, multiple sclerosis, Parkinson's disease, Crohn's disease, diabetes, celiac disease, irritable bowel syndrome, stroke, diverticulosis, cerebral palsy, and spinal cord injury, which can cause either sluggish intestinal contractions or chronic colonic spasm, both of which can slow down the movement of stool (Talley et al., 2003).
- Use of constipating medications, including opiates, diuretics, antidepressants, antacids, antihistamines, iron preparations and anticonvulsants. Opiates, for example, decrease peristaltic contractions as well as the urge to defecate. Use of aspirin, acetominaphen and non-steroidal anti-inflammatory medications is also associated with chronic constipation (Chang et al., 2007).
- Mechanical obstruction: The small or large intestines may compressed by tumors, hernias, prolapsed internal organs, chronic colonic spasm, the weight of a fetus during pregnancy or an accumulation of hard, dry feces. Intestinal adhesions which can narrow the lumen of the bowel may result from previous abdominal infections, blunt abdominal trauma, endometriosis, radiation treatment of the pelvis, and abdominal surgery, especially that of the large intestine, appendix or uterus (Barral, 2005; Dondelinger, 2004; Klingele, 2005; McKay and Hirano, 1998; Opoien et al., 2007) (see Figures 4 and 5).
- Emotional stress. The gastrointestinal tract contains both sympathetic and parasympathetic nerve fibers, and under emotional stress, sympathetic function predominates, contracting sphincters, constricting digestive system blood vessels and inhibiting both motility and secretion. Stimulation of the parasympathetic nerve supply of the colon increases its motor activity, while sympathetic stimulation decreases it. Conditions such as anxiety, depression and cognitive impairment may contribute to constipation ((Stam et al., 1997, Petticrew et al., 2001)) Victims of physical and/or sexual abuse during childhood are more likely to suffer from chronic constipation than control subjects who did not experience abuse. (Walling et al., 1994) Numerous case reports are available of successful treatment of constipation when the sole intervention was psychiatric (Clarke, 2007; Devroede et al., 1989; Drossman et al., 1990; Jarrell, 2003; Latimer, 1983; McMahon and Koltenburg, 2006; Mayer, 1993; Shorter, 1993).

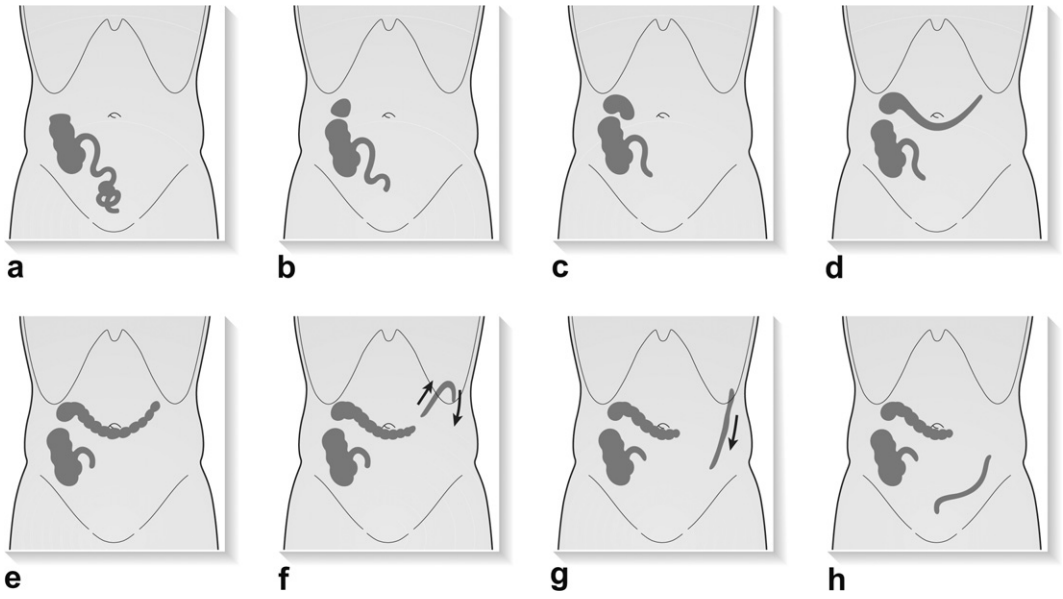

Figure 3 "Stages of a Mass Movement of the Colon", adapted from Hertz, A. F., Am J Physiolo 47: 57—65, 1913 A. The subject (an adult male with no gastrointestinal pathology) took 2 ounces of barium sulfate suspension along with breakfast. Five hours later, fecal material (the shadows at the end of the ileum, the caecum and the ascending colon) was visible. B. The subject then ate a lunch of meat, vegetables and pudding. The end of his ileum emptied rapidly during the meal, while his caecum and ascending colon filled. Towards the end of the meal, a large round mass at his hepatic flexure became cut off from the rest of his ascending colon. C. Immediately after the meal was finished, some of the mass moved slowly around his hepatic flexure. D. The diameter of the separated portion suddenly became much smaller and the large round shape changed into a long narrow one which extended from his hepatic flexure almost to his splenic flexure. E. After a few seconds, the long narrow shape developed haustral segmentation. F. Five minutes later, the long narrow shape suddenly become more elongated and passed around his splenic flexure. G. The long narrow shape immediately passed down his descending colon H. The long narrow shape immediately passed into the beginning of his sigmoid colon

stool. In one case, moderate hand pressure to the lower abdomen elicited measurable waves of rectal muscle contractions in a patient within 10 s (Sakakibara, R., personal communication, Dec 20, 2009, sakakibara@sakura.med.toho-u.ak.jp).

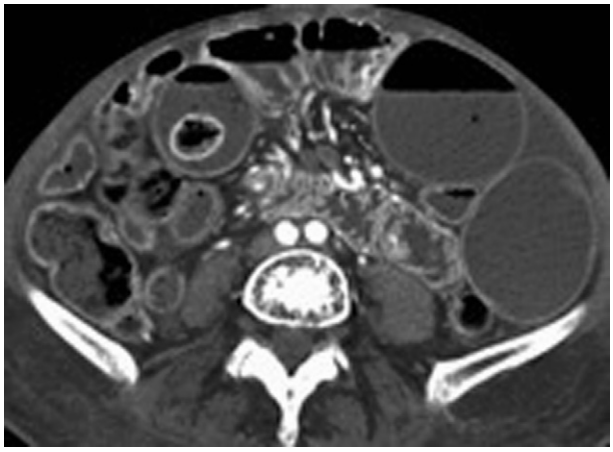

Figure 4 "Small bowel obstruction secondary to adhesion from abdominal surgery" reprinted from Ros, P., "CT and MRI of the Abdomen and Pelvis: a Teaching File, second edition", Baltimore: Lippincott, Williams and Wilkins, 2007.

Symptoms

In addition to a reduced number of bowel movements, symptoms of constipation also include straining during defecation, slower colonic transit time, hard lumpy stools, abdominal distention and pain, sensations of incomplete defecation, decreased mood, decreased enjoyment of life, and sometimes limitations in recreation and work (Clarke et al., 2008; Dennison et al., 2005; Johanson et al., 2007). Chronic straining to pass stool can lead to physical changes, including hemorrhoids, hernias, anal fissures, laxity of colonic muscle fibers, thickening of the colonic wall as a result of the high pressure needed to push hard stool along, and activation of myofascial trigger points (Travell et al., 1999). During a bowel movement, a bolus of hard feces pressing against the left iliopsoas muscle can cause referred pain in that muscle's pain referral area (Travell et al., 1999). Increased intra-colonic pressure secondary to constipation can lead to weakness in the colon walls, particularly in the sigmoid colon, predisposing patients to diverticulosis (ADA, 2008). Long-term use of laxatives may be a risk factor for the development of colonrectal cancer, possibly because toxicants have more time to be absorbed by the lining of the colon (Brocklehurst et al., 1998; Jacobs, 1998; Roberts et al., 2003; Watanabe et al., 2004). Other complications that can develop from chronic constipation include decreased rectal sensitivity,

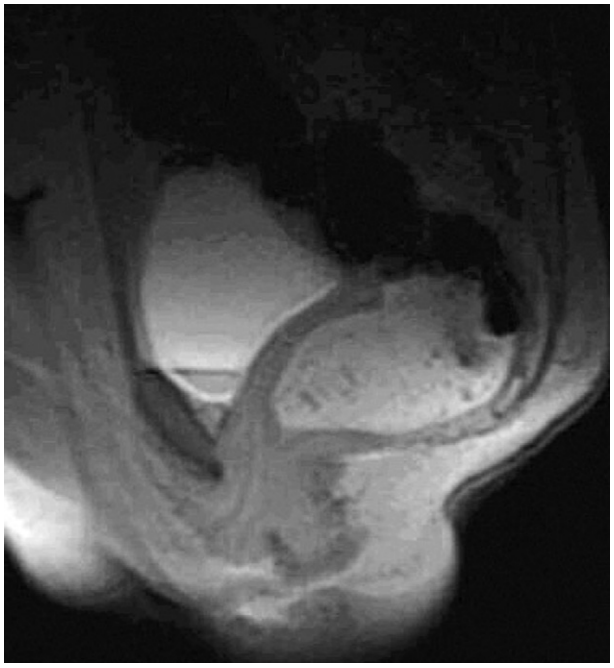

Figure 5 "Constipation due to pelvic organ prolapse: anterior rectocele (herniation of posterior vaginal wall) caused by vaginal childbirth", reprinted with permission from Ros, P., "CT and MRI of the Abdomen and Pelvis: a Teaching File, second edition", Baltimore: Lippincott, Williams and Wilkins, 2007.

fecal impaction, incontinence, and even bowel perforations (Kamm and Lennard-Jones, 1990).

Discussion

The two randomized controlled trials performed since 1999 indicate that abdominal pressure or massage increases peristalsis, and thus could be helpful for increasing bowel function and decreasing chronic constipation (Lamas et al., 2009, and Le Blanc-Louvry et al., 2002).

In addition, the 6 observational studies and 4 case reports that have appeared since Ernst's call for further research add weight to the evidence for the effectiveness of abdominal massage. Despite the fact that there were many variations in the massage technique, amount of pressure applied, whether a patient or a healthcare professional performed it, how it was applied (even pressure from a machine stimulated peristalsis), the number of sessions and the duration of the studies, in each case massage was still effective in reducing constipation. In most, massage was performed by a healthcare professional, but in 2, massage was self-administered. Sometimes other interventions were combined with abdominal massage, such as aromatherapy, chiropractic manipulations or dietary changes. (In Lamas's 2009 and Liu's 2005 studies, however, neither fluid, fiber intake or exercise was altered). Participants' health status also varied widely.

Professional massage practitioners have often noted that manual pressure over the abdomen can stimulate bowel sounds, passage of flatus, and/or bowel movements. For over 25 years, the author has witnessed bowel movements occurring during infant massage classes when abdominal massage is performed by parents, and during massage sessions, constipated older children and adults having to visit the bathroom immediately after abdominal massage.

The mechanisms behind abdominal massage's constipation-reducing effect are not fully understood, but are most likely are a combination of stimulation and relaxation. Direct pressure over the abdominal wall alternately compresses and then releases sections of the digestive tract, briefly distorting lumen size and activating stretch receptors that can reinforce the gastrocolic reflex and trigger intestinal and rectal contraction (Brookes et al., 2004). Liu found that pressure on the lower abdomen elicited measurable waves of rectal muscle contraction in a spinal cord injured patient with viral myelopathy, a condition similar in outcome to a spinal cord injury. The patient typically had no ability to strain when attempting to defecate, with only small, infrequent, rectal muscle contraction. When her abdomen became distended with feces, the patient applied moderate pressure to her lower abdomen, using a rolling motion of her hand which elicited the waves of rectal muscle contraction and intermittent defecation through her anal sphincter. (Sakakibara, R., personal communication, Dec 20, 2009) Case reports by Harrington, Shirreffs and Preece found abdominal massage was helpful for constipation due to muscle weakness or slowed colonic motility induced by medications (Harrington and Haskvitz, 2006; Preece, 2002; Shirreffs, 2001).

Liu concluded that the massage might trigger defecation not only through activation of intestinal stretch receptors, but also by stimulating somato-autonomic reflexes (Liu et al., 2005) Colonic transit time may be decreased by this mechanism (Ayas et al., 2006). Abdominal massage may affect also constipation by a very different mechanism, that of stimulating the parasympathetic nervous system, thus decreasing abdominal muscle tension, increasing motility of digestive tract muscles, increasing digestive secretions, and relaxing sphincters in the digestive tract. In Lamas's study, the massage employed was a light rhythmic touch, performed in an environment designed to enhance relaxation (Lamas et al., 2009). Diego et al found that abdominal massage in premature infants could measurably increase vagal activity and gastric motility (Diego, 2005). An earlier case report of abdominal massage for a chronically constipated patient with abdominal spasticity due to cerebral palsy reported that 30 min after abdominal massage, the patient typically had a bowel movement without an enema: the author concluded that the release of abdominal muscle tension through massage increased peristalsis. (Emly, 1998). Given the current evidence, it is unlikely that stool is manually propelled along the digestive tract towards the rectum during abdominal massage, as some early practitioners believed.

Conclusion

Abdominal massage has measurable effects upon constipation, either low muscle tone through stimulation, or spasmodic muscle states through relaxation. However, neither of these effects would result in stool being

manually propelled along the digestive tract towards the rectum.

Abdominal massage can stimulate peristalsis, decrease colonic transit time, increase the frequency of bowel movements in constipated patients, and decrease the feelings of discomfort and pain that accompany it. Individual case reports show that massage has been effective for patients with chronic constipation due to a variety of diagnosed physiologic abnormalities and in patients with long-term functional constipation. There is also sound scientific evidence that massage can stimulate peristalsis in patients with post-surgical ilieus. Its effectiveness, lack of side-effects, and low-cost (especially if self-administered), make abdominal massage an attractive option in bowel management programs for persons with chronic constipation. One set of guidelines for holistic management of chronic constipation in primary care has been developed by a multi-professional group of healthcare practitioners in the United Kingdom. These guidelines combine abdominal massage with education of patients regarding toileting habits, exercise and diet, monitoring use of possibly constipating medications and prescribing laxatives if other methods have not been successful (Emly and Rochester, 2006). In cases where patients must receive constipating medications, such as the 87% of late-stage cancer patients who become constipated as a direct result of their opioid medication, the condition may add greatly to suffering from the patient's actual disease (Petticrew et al., 2001; Riechelmann et al., 2007). Here, abdominal massage may significantly improve quality of life: it decreased constipation and associated abdominal discomfort in hospice patients (Preece, 2002).

Drawbacks of abdominal massage include the need to perform massage repeatedly to see results, and to continue the massage for extended periods of time. There are a number of important questions on this topic that future research could address: for example, might the effectiveness of abdominal massage depend upon the cause of the constipation? For example, is abdominal massage more or less effective when the constipation stems from an underactive thyroid or a diet lacking in fiber, than if it is caused by a spinal cord injury? And what if the functional constipation stems from pelvic floor dysfunction rather than slow-transit constipation or constipation-predominant irritable bowel syndrome? Further research is required to identify sub-groups of patients that might benefit from abdominal massage. Fruitful research might also be performed to identify the types of patients who would be the best candidates to learn self-massage. Abdominal massage techniques are not complex, and in two of the case studies, self-massage effectively relieved constipation. Many laypeople could be taught to perform this technique on a regular basis, much as they brush their teeth regularly.

How long abdominal massage should be administered is also an important question investigation. One study which was conducted with elderly patients found constipation was decreased after only ten days of abdominal massage, and that the effect lasted for 7—10 days after massage was stopped, while Lama's massage found no effect until 8 weeks of treatment (Kim et al., 2005; Lamas et al., 2009).

A study investigating different pressure techniques could also be enlightening. Varying amounts have been used, from the light-pressure technique of Lamas to the moderate-pressure technique used by Preece (Kim et al., 2005; Jeon and Jung, 2005; Emly, 2001; Preece, 2002).

A further question of interest is which techniques are the most effective in treating constipation. Some investigators found that Swedish massage was effective, however, mechanical massage has been effective as well. These techniques are far more alike than they are different.

Text box 2. A Typical Swedish Massage of the Abdomen for Constipation

Contraindications include abdominal obstruction, abdominal mass, intestinal bleeding, abdominal radiation therapy, strangulated hernia and less than 6 weeks post-abdominal surgery.

1. Effleurage of the entire abdomen-10 times.
2. Effleurage of the rectus abdominis, external and internal obliques and transverse abdominis muscles-10 times each.
3. Kneading of the abdomen-3 times.
4. Clockwise effleurage over the presumed path of the colon-10 times.
5. Vibration of the small and large intestines-one minute, or more.
6. Repeat step 4.
7. Kneading over the presumed path of the colon, with the fist, heel of the hand or thumbs-one minute or more.
8. Petrissage over the presumed path of the colon-one time.
9. Vibration over the presumed path of the colon.
10. Repeat Step 4.

Techniques used in different studies varied to some extent: for example, Lamas et al. (2009) used primarily light-pressure effleurage of the abdomen for a total of 7 min, while Emly (2001, 2006) used moderate-pressure effleurage, kneading and vibration, for a total of 15—20 min, while Preece (2002) used propulsive massage, for a total of 10 min.

References

American Dietetic Association, 2008. Health Implications of dietary fiber. Journal of the American Dietetic Association 108, 1716–1731.

Addison, R., et al., 18 March 2003. A national audit of chronic constipation in the community. Nursing Times 99 (11), 34–35.

Albers, B., et al., March 2006. Abdominal massage as intervention for patients with paraplegia caused by spinal cord injury-a pilot study. Pflege Z. 59 (3), 2–8.

Ayas, S., et al., Dec 2006. The effect of abdominal massage on bowel function in patients with spinal cord injury. American Journal of Physical Medicine Rehabilation 85 (12), 951–955.

Barral, J., 2005. Visceral Manipulation. Eastland Press, Seattle, Washington.

Birkestad, G., 1999. Beroring i vard och omsorg. Ofeigur forlag, Solna.

Brocklehurst, J., et al., 1998. Laxatives and fecal incontinence in long-term care. Nursing Standards 13 (52), 32–36.

Brookes, S.J.H., et al., 2004. Initiation of peristalsis by circumferential stretch of flat sheets of guinea pig ileum. Journal of Physiology 516 (2), 525–538.

Chang, J.Y., et al., 2007. Risk factors for chronic constipation and a possible role of analgesics. Neurogastroenterological Motility 19, 905–911.

Chia, Mantak, 1991. Chi Nei Tsang: Internal Organ Chi Massage. Thailand Healing Tao Center, Chiang Mai.

Clarke, D., 2007. They Can't Find Anything Wrong: 7 Keys to Understanding, Treating and Healing Stress Illness. Sentient Publications, Boulder, Colorado.

Clarke, M.C., et al., Feb 2008. Quality of life in children with slow-transit constipation. Journal of Pediatric Surgery 43 (2), 320–324.

Cordain, L., Mar 1986. The effects of an aerobic running program on bowel transit time. Journal of Sports Medicine Physical Fitness 26 (1), 101–104.

Davies, E.C., et al., Sept 2009. The use of opioids and laxatives and the incidence of constipation in patients requiring neck of the femur surgery: a pilot study. Journal of Clinical Pharmacology and Therapeutics 33 (5), 561–566.

De Oliveira, E.P., Burrini, R.C., Sept 2009. The impact of physical exercise on the gastrointestinal tract. Current Opinion in Clinical Nutrition and Metabolic Care 12 (5), 533–538.

Dennison, C., et al., 2005. The health-related quality of life and Economic Burden of constipation. Pharmacoeconomics 23 (5), 461–476.

Devroede, G., et al., 1989. Idiopathic constipation by colonic dysfunction: relationship between personality and anxiety. Digestive Diseases and Sciences 34 (9), 1428–1433.

Diego, M.A., 2005. Vagal activity, gastric motility, and weight gain in massaged preterm neonates. Journal of Pediatrics 147 (1), 50–55.

Dondelinger, R.F., 2004. Imaging and Intervention in Abdominal Trauma. Springer, New York.

Dorman, T., 2006. Colonics, Townsend Letter: the Examiner of Alternative Medicine, July, pp. 77–81.

Drossman, et al., 1990. Sexual and physical abuse in women with functional or organic gastrointestinal disorders. Annals of Internal Medicine 113, 701–708.

Emly, M., 1998. Colonic motility in profoundly disabled people: a comparison of massage and laxative therapy in the management of constipation. Physiotherapy 84 (4), 178–183.

Emly, M., Jul 26–Aug 1 2001. Abdominal massage for adults with learning disabilities. Nursing Times 97 (30), 61–62.

Emly, M., Rochester, P., 11 Aug 2006. A new look at constipation management in the community. British Journal of Community Nursing 11 (8), 328–332. 326.

Ernst, E., 1999. Abdominal massage for chronic constipation: a systematic review of controlled clinical trials. Research in Complementary Medicine 6 (3), 149–151.

Fernandez, E., 2006. Deep Tissue Massage Treatment: a Handbook of Neuromuscular Therapy. Mosby Elsevier, St. Louis, Missouri.

Harrington, K.L., Haskvitz, E.M., Nov 2006. Managing a patient's constipation with physical therapy. Physical Therapy 86 (11), 1511–1519.

Higgins, P.D., 2004. Epidemiology of constipation in North America: a systematic review. Am Journal of Gastroenterology 99 (4), 750–759.

Jacobs, E.J., Jul 1998. Constipation, laxative use, and colon cancer among middle aged adults. Epidemiology 9 (4), 385–391.

Jarrell, J., Feb, 2003. Myofascial dysfunction and pelvic pain. Canadian Journal of CME, 107–116.

Jeon, S., Jung, H.M., Feb 2005. The effects of abdominal meridian massage on constipation among CVA patients. Taehan Kanho Hakhow Chi 35 (1), 135–142.

Johanson, J., et al., 2007. Review of the treatment options for chronic constipation. Medscape General Medicine 9 (2), 25.

Johnson, J.F., 1989. Clinical Epidemiology of chronic constipation. Journal of Clinical Gatroenterology 11, 516–536.

Joyce, P., Clark, C., 1996. The use of Craniosacral therapy to Treat Gastroesophageal Reflux in infants. Infants and Young Children 9 (2), 51–57.

Kamm, M.A., Lennard-Jones, J.E., 1990. Rectal muscosal electrosensory testing: evidence for a rectal sensory neuropathy in idiopathic constipation. Diseases of the Colon and Rectum 33, 419–423.

Kellogg, J.K., 1923. The Art of Massage: A Practical Manual for the Nurse, the Student, and the Practitioner. Modern Medicine Publishing Co, Battle Creek, Michigan.

Kim, M.A., et al., Feb 2005. Effect of aromatherapy massage for the relief of constipation in the elderly. Taehan Kanho Hakhoe Chi 35 (1), 56–64.

King, E., WEick, L., Dyer, M., 1986. Illustrated Manual of Nursing Techniques, third ed. JB Lippincott, Williams and Wilkins, , Philadelphia.

Kleen, E., 1921. Massage and Medical Gymnastics. J.A. Churchill, London.

Klingele, C.J., Aug 2005. Pelvic organ prolapse in defecatory disorders. Obstetrics and Gynecology 106 (2), 315–320.

Lamas, K., et al., 2009. Effects of Abdominal Massage in management of constipation. International Journal of Nursing Studies.

Latimer, P., 1983. Functional Gastrointestinal Disorders, a Behavioral Medicine Approach. Springer Publishing, New York.

Le Blanc-Louvry, I., et al., Feb 2002. Does mechanical massage of the abdominal wall after colectomy reduce post-operative pain and shorten the duration of ileus: results of a randomized study. Journal of Gastrointestinal Surgery 6 (1), 43–49.

Leung, F.W., 2007. Etiologic factors of chronic constipation: review of the scientific evidence. Digestive Diseases and Sciences 52 (2), 313–316.

Lippincott's, 2008. Nursing Procedures. Lippincott Williams and Wilkins, Baltimore, MD.

Liu, Z., et al., 2005. Mechanism of abdominal massage for difficult defecation in a patient with myelopathy. Journal of Neurology 252, 1280–1282.

Locke, G.R., Pemberton, J.H., Phillips, S.F., 2000. American Gastroenterological Association medical Position Statement: guidelines on constipation. Gastroenterology 119 (6), 1761–1766.

Marin, Gilles, 1999. Healing from Within with Chi Nei Tsang: Applied Chi Kung in Internal Organs Treatment. North Atlantic Books, Berkeley, Ca.

Mariotti, R., 2009. A Naturopathic Approach to Visceral Manipulation. Healing Mountain Publishing, Seattle, WA.

Matsumoto, K., Birch, S., 1998. Hara Diagnosis: Reflections on the Sea. Paradigm Pub, Taos, New Mexico.

Mayer, E. (Ed.), 1993. Basic and Clinical Aspects of Chronic Abdominal Pain. Elselvier, New York.
McKay, J., Hirano, N., 1998. The Chemotherapy and Radiation Therapy Survival Guide. New Harbinger Publications, Oakland, California, 33 pp.
Mcmahon, S., Koltenburg, M. (Eds.), 2006. Wall and Melzak's Textbook of Pain, fifth ed. Elselvier, Churchill Livingstone p. 764.
Moriarty, J.K., Dawson, A.M., 1982. Functional abdominal pain further evidence that the whole gut is affected. British Journal of Medicine 284, 1670—1672.
Neya, T., 1993. Role of 5HT3 Receptors in peristaltic reflex elicited by stroking the mucosa in the canine jejunum. Jornal of Physiology 471, 159—173.
Oettle, G.J., 1991. Effect of moderate exercise on bowel habit. Gut 32, 941—944.
Opoien, H.K., et al., 2007. Al, Post-Caesarean surgical site infections according to CDC standards: rates and risk factors. A prospective cohort study. Acta Obstetrics and Gynecology Scandinavia 86 (9), 1097—1102.
Peters, H.P., et al., Mar 2001. Potential benefits and hazards of physical activity and exercise in the gastrointestinal tract. Gut 48 (3), 435—439.
Petticrew, M., et al., Dec 2001. Effectiveness of laxatives in adults. Quality and Safety in Health Care 10 (4), 268—273.
Preece, J., May 2002. Introducing abdominal massage in palliative care for the relief of Constipation. Complementary Therapies in Nursing and Midwifery 8 (2), 101—105.
Quist, D., 2007. Resolution of symptoms of chronic constipation in an 8 year old male after chiropractic treatment. Journal of Manipulative and Physiological Therapeutics 30 (1), 65—68.
Raahave, D., et al., Nov 2004. Additional faecal reservoirs or hidden constipation: a link between functional and organic bowel disease. Danish Medical Bulletin 51 (4), 422—425.
Rao, S.S., Jul 1998. Obstructive Defecation: a failure of rectoanal coordination. American Journal of Gastroenerology 93 (7), 1042—1050.
Rao, S.S., Sept 2008. Dyssynergic defecation and Biofeedback therapy. Gastroenterology Clinics of NorthAmerica 37 (3), 569—581.
Rao, S.S., et al., May 2009. Investigation of colonic and whole-gut transit with wireless motility capsule and radiopaque markers in constipation. Clinical Gastroenterology and Hepatology 7 (5), 537—544.
Riechelmann, R.P., et al., Dec 2007. Symptom and medication profiles among cancer patients attending a palliative care clinic. Support Care Cancer 15 (12), 1407—1412.
Roberts, M.C., et al., April 2003. Constipation, laxative use, and colon cancer in a North Carolina population. American Journal of Gastroenterology 98 (4), 857—864.
Shan, N., et al., June 2008. Ambulatory care for constipation in the United States, 1993—2004. American Journal of Gastroenterology 103 (7), 1746—1753.
Shirreffs, C.M., May 2001. Aromatherapy massage for joint pain and constipation in a patient with Guillian Barre. Complementary Therapies in Nursing and Midwifery 2 87—83.
Shorter, E., 1993. From Paralysis to Fatigue: A History of Psychosomatic Illness in the Modern Era. Free Press, New York.
Sinclair, M., 2004. Pediatric Massage Therapy. Lippincott, Williams and Wilkins, Baltimore.
Southwell, B.R., et al., Jul 2009. Colonic transit studies: normal values for adults and children with comparison of radiological and scintigraphic methods. Pediatric Surgery International 25 (7), 559—572.
Stam, R., et al., June 1997. Trauma and the gut: interaction between stressful life experiences and intestinal function. Gut 40 (6), 704—709.
Starr, L., 1903. Hygiene of the Nursery: Including the General Regimen and Feeding of Infants and Children; Massage and the Domestic Management of the Ordinary Emergencies of Early Life. P Bakiston's Son and Co, Philadelphia.
Talley, N., et al., 2003. Risk factors for chronic constipation based on a general Practice Sample. American Journal of Gastroenterology 98, 1107—1111.
Talley, N., 2004. Definitions, Epidemiology, and Impact of chronic constipation. Reviews in Gastroenterological Disorders 4 (Suppl. 2), S3—S10.
Travell, J., Simons, D., Travell, J., 1999. Travell and Simon's Myofascial Pain and Dysfunction: The Triggerpoint Manual. In: Upper Body, second ed., vol. 1. Lippincott, Williams and Wilkins, Baltimore, Maryland, pp. 953—959.
Van de Berg, M.M., et al., Oct 2006. Epidemiology of childhood constipation. American Journal of Gastroenterology 101 (10), 2401—2409.
van der Sijp, J.R., et al., March 1993. Radioisotope determination of regional colonic transit in severe constipation: comparison with radio opaque markers. Gut 34 (3), 402—408.
Wald, A., et al., 2008. A Multinational survey of Prevalence and Patterns of laxative use among adults with self-Defined constipation. Alimentary Pharmacology and Therapeutics 28 (7), 917—930.
Walling, Mary, et al., 1994. Abuse history and chronic pain in women: II. A multivariate analysis of abuse and psychological morbidity. Obstetrics and Gynecology 84 (2).
Watanabe, T., et al., 2004. Constipation, laxative use, and risk of colorectal cancer: the Miyagi Cohort Study. European Journal of Cancer 40 (14), 2109—2115.
Whorton, J., 2000. Inner Hygiene: Constipation and the Pursuit of Health in Modern Society. Oxford University Press, New York, 149 pp.