



A case of post-colonoscopy intra/extraperitoneal free air: is surgical treatment always necessary?

Kolonoskopi sonrası intra-ekstraperitoneal serbest hava olgusu: Cerrahi müdahale her zaman gerekli midir?

Halil İbrahim Taşcı 

Erdal Karagülle 

Emin Türk 

Department of General Surgery, Başkent University Medical Faculty, Konya, Türkiye

ABSTRACT

Colonoscopy-related colonic perforation may occur through pneumatic or mechanical impact, or due to various therapeutic procedures. Mucosal herniation may develop because of an increase in post-air insufflation pressure. This condition may render the mucosa air-permeable without a distinct focal perforation point.

A 63-year-old female patient, who had had surgery for malign rectal neoplasm five years ago and followed-up for radiation proctitis, presented to the emergency department three days after she had control colonoscopy with complaints of a gradually deteriorating facial and cervical swelling along with respiratory distress that developed a day after the procedure. The results of the patient's analyses revealed that she had colonoscopy-related pneumoperitoneum, pneumoretroperitoneum, pneumomediastinum, cervical and facial subcutaneous emphysema. Medical follow-up was planned for the patient since there were no signs of peritonitis in her physical examination, her overall condition was well, and because a long time had passed after the procedure. The patient was discharged after a two-day follow-up with no problems.

Colonoscopy-related intraperitoneal or extraperitoneal free air can both be seen immediately during the procedure, or it can develop a long time after the procedure as well. Unnecessary surgical procedures can be prevented through medical follow-up under close monitoring in such patients particularly if they do not have signs or symptoms of peritonitis and their overall condition is well.

Keywords: Colonoscopy, pneumomediastinum, pneumoperitoneum, subcutaneous emphysema.

ÖZ

Kolonoskopi işlemine bağlı kalın bağırsak perforasyonu pnömotik veya mekanik etkiyle ya da terapötik işlemlere bağlı gelişebilmektedir. Hava insüflasyonu sonrası basınç artışına bağlı mukozada herniasyon gelişebilir. Bu durum, mukozayı belirgin perforasyon odağı olmaksızın havaya geçirgen hale getirebilir.

Rektum malign neoplazmi için beş yıl önce ameliyat edilmiş ve radyasyon proktiti nedeni ile takipli 63 yaşında bir kadın hasta, yapılan kontrol kolonoskopi işleminden bir gün sonra başlayan, yavaş yavaş artan yüzde ve boyunda şişlik, nefes darlığı şikayetleri ile işlemden 3 gün sonra acil servise başvurdu. Yapılan tetkiklerinde kolonoskopiye bağlı pnömoperitoneum, pnömoretroperitoneum, pnömomediastinum, servikal ve fasyal subkutan amfizem saptandı. Hastanın fizik muayenesinde peritonit bulguları olmaması, genel durumunun iyi ve işlemin üzerinden uzun süre geçmiş olması üzerine medikal takibine karar verildi. Hasta iki günlük takip sonrasında sorunsuz şekilde taburcu edildi.

Corresponding author: Halil İbrahim Taşcı

Department of General Surgery, Başkent University Medical Faculty, Konya, Türkiye

E-mail: okcu6528@gmail.com

Application date: 03.05.2021

Accepted: 09.07.2021

Kolonoskopiye bađlı intaperitoneal ya da ekstraperitoneal alanda serbest hava grlmesi hemen iřlem esnasında olabileceđi gibi uzun sre sonra da geliřebilmektedir. Bu hastalarda zellikle peritonit bulgusu yoksa, genel durumu iyi ise yakın gzlem altında medikal takip ile gereksiz cerrahi mdahaleler nlenebilir.

Anahtar Szckler: Kolonoskopi, pnmmediastinum, pnmoperitoneum, subkutan amfizem.

INTRODUCTION

Colonoscopy is commonly used in the diagnosis and treatment of colorectal diseases. Although it is acknowledged to be a safe and routine procedure, it may rarely lead to complications like hemorrhage and perforation (1). Although intraperitoneal perforation is seen relatively more common as a complication, extraperitoneal perforation that may accompany pneumomediastinum, pneumoperitoneum and subcutaneous emphysema is quite a rare condition (2). If the extraperitoneal area is perforated, gas progresses in the retroperitoneal area and may cause pneumoretroperitoneum, pneumomediastinum, pneumoscrotum and subcutaneous emphysema (3).

This case report presents, along with literature review, the case of a 63-year-old female patient, who had had rectal malignancy surgery and developed adjuvant radiotherapy-related radiation proctitis, medically followed-up for pneumoperitoneum, pneumoretroperitoneum, pneumomediastinum, cervical and facial subcutaneous emphysema that occurred following diagnostic colonoscopy.

THE CASE

A 63-year-old female patient, who had had low anterior resection because of malign rectal neoplasm five years before, had also received adjuvant chemotherapy and radiotherapy. The patient had been receiving mesalazine enema treatment for the last two years until three months ago because of radiotherapy-related radiation proctitis. The patient presented with complaints of indigestion, abdominal pain and swelling, and intermittent nausea-vomiting pending for the last couple of weeks. Upon the identification of wall thickening in her rectal area as was shown by computerized abdominal tomography, colonoscopy was planned for the patient having been pre-diagnosed with anastomotic stenosis. An edematous, inflamed, hyperemic area starting from the anal canal onwards at 15 cm and lumen stenosis were observed during the colonoscopy. The procedure was stopped because of

perforation risk and no other invasive procedure was performed. The patient was discharged after no complications were observed following colonoscopy. The patient reportedly suffered from gradually deteriorating swellings that occurred about a day after the procedure on her neck, shoulder, anterior and exterior thoracic wall. The patient, who had had no other complaints other than swelling initially, presented to the emergency department three days later when she also developed respiratory distress.

The patient's physical examination revealed that her vitals were normal. There was crepitation in the swollen areas of the patient and her respiratory sounds were partially reduced. Her abdominal examination showed no signs of sensitivity, rebound sensitivity and defense except for mild distention. The results of her laboratory analyses showed that C-reactive protein and leukocyte values were within normal bounds. Oxygen saturation level in blood gas was 95%. Her erect direct abdominal radiograph showed diffuse subdiaphragmatic free air images on both sides (Figure-1a). The patient's cervical and pulmonary tomography showed images of gas starting from the paralaryngeal areas moving on to the thoracic wall as well among soft tissues that were prevalent in the whole mediastinum (Figures-1b, 1c). There were no indicators of pneumothorax.

Medical follow-up was planned for the patient based on the fact that no pneumothorax was seen in her imaging and examination results, the absence of peritoneal irritation signs in spite of the fact that three days had passed after the colonoscopy procedure, and the fact that her laboratory results were within normal values. Oral feeding was stopped, while intravenous hydration, ceftriaxone and metronidazole were started. The patient was discharged without any problems following a two-day close monitoring period through physical examination and laboratory analyses in order to prevent a possible surgical acute abdominal event. The patient had no distinctive complaints at the follow-up done 15 days after the colonoscopy. Thoracoabdominal and cervical tomography of the patient showed

that the subcutaneous emphysema was altogether gone and pneumomediastinum was almost completely gone, while pneumoperitoneum and pneumoretroperitoneum diminished (Figure-1d).

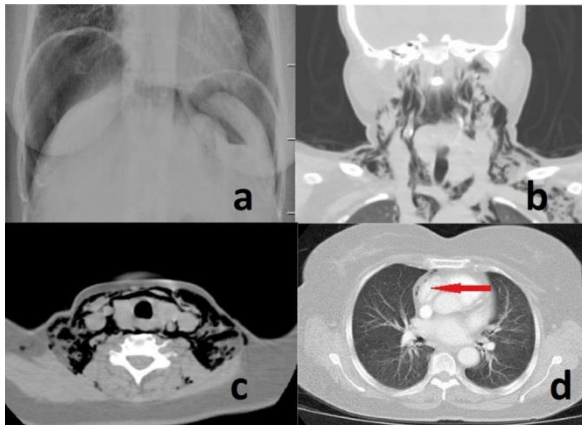


Figure-1. At the time of application: image of subdiaphragmatic free air on both sides on erect direct abdominal radiography (a), diffuse gas images originating in paralaryngeal areas proceeding on the thoracic wall among soft tissues and mediastinum on computerized tomography (b,c); after conservative treatment: minimal gas in the mediastinum (d) (red arrow: free air in the mediastinum) images on computerized tomography.

DISCUSSION

The risk of colonic perforation during diagnostic colonoscopy ranges between 0.2% and 0.4%. It was reported that such risk went up to 1% in patients receiving polypectomy while the figure went as high as 4.6% in patients receiving balloon dilatation of colonic stenosis (4). Perforation is most commonly seen in the sigmoid colon (2). Colonoscopy-related colonic perforation is explained by three different mechanisms: mechanical, pneumatic, and those related to therapeutic procedures (5). Pneumatic and mechanical perforations are frequently seen in areas where the colonic wall is weaker like anastomosis areas of patients with a history of diverticulitis, inflammatory intestinal disease, ischemic colitis or surgery (5). Mucosal herniation may as well develop due to increased intraluminal pressure because of air insufflation during the procedure resulting in pneumatic impact. This situation may render the mucosa air-permeable without a visible focal perforation point (6). Further, deep ulcerations in the colonic wall may also lead to gas leakage without a

noticeable perforation (7). Surgical anastomosis and radiation proctitis that might have set the stage for perforation were present in the case presented.

It was reported that during diagnostic and/or therapeutic colonoscopy procedures extraluminal gas brought about by the above-mentioned reasons might rarely cause pneumoperitoneum, pneumoretroperitoneum, pneumatosis cystoides intestinalis, pneumomediastinum, pneumoscotum, subcutaneous emphysema, pneumothorax, and pneumopericardium (3). The connection among the neck, thorax and the abdomen are maintained by subcutaneous tissues, prevertebral tissues, visceral and perivisceral areas. The visceral cavity proceeds on to the mediastinum surrounding the trachea and esophagus. Then it proceeds on to the retroperitoneal soft tissue cavity from the diaphragmatic hiatus following the esophagus (4). Air emerging in any of these areas, therefore, may pass on to other areas as well. Similarly, subcutaneous emphysema may also occur (4). In the case presented colonoscopy-related extraperitoneal free air was present in the intraperitoneal, retroperitoneal, mediastinal areas accompanied by cervical and fascial subcutaneous emphysema.

Patients' symptoms vary depending on whether the perforation is intraperitoneal or extraperitoneal. While signs and symptoms of peritonitis are frequently seen in cases with intraperitoneal perforation, patients with retroperitoneal perforation have a more silent clinical course (4). In contrast to patients with intraperitoneal perforation, patients with retroperitoneal perforation do not usually have pain. Patients with retroperitoneal perforation may contract respiratory distress due to the subcutaneous emphysema in the pneumomediastinum and the neck. Other clinical and laboratory indicators include fever and leukocytosis (8). Perforation is commonly seen in the intraperitoneal or extraperitoneal areas, yet it is rarely seen in both (5). In our case report, both areas were involved but no other signs were observed clinically other than respiratory distress due to the subcutaneous emphysema in the pneumomediastinum and the neck.

Posterior-anterior chest radiography, erect direct abdominal radiography, and computerized tomography are quite useful in the diagnosis of intraperitoneal and extraperitoneal perforations

and in the differentiation of affected areas (4). Erect direct abdominal radiography and computerized tomography were guiding in the diagnosis of our patient.

It is the patients' clinical signs that determine whether surgical intervention is called for or a conservative modality should be preferred in the treatment of such patients. Presence of subdiaphragmatic free air is not an indication for surgical intervention on its own (9). The risk of generalized peritonitis related to the colon, which remains relatively clean, is lower in colonoscopy-related perforation cases (4). The size of the perforation, elapsed time after the onset of the event, and the patient's overall condition constitute the factors that ascertain surgical or non-surgical treatment modalities (4). Yet physicians should be ready for an emergency surgical intervention in the case of a generalized peritonitis that might be seen in patients for whom a conservative treatment modality had been preferred. Our patient was discharged without any problems as she had been

diagnosed three days after the colonoscopy procedure along with the fact that she had had no distinct clinical or laboratory indicators.

Colonoscopy-related free air can be seen in both intraperitoneal and extraperitoneal areas in patients particularly with such predisposing factors as previous history of inflammatory bowel disease, surgical anastomoses, and radiation proctitis even when a partial examination was performed. It should be remembered that this condition might develop both during the procedure and a long time after the procedure. We believe that medical follow-up under close monitoring will prevent unnecessary surgical procedures specifically in patients with no signs of peritonitis and good overall condition.

Conflict of interest statement: No potential conflict of interest was reported by the authors for the drafting and publication stages of this study.

Informed Consent

Written consent was obtained from the patient that her medical data could be published.

References

1. Huh JK, No HS, Lim HH et al. Subcutaneous emphysema, pneumomediastinum and pneumoperitoneum after colonoscopy. *Korean J Med* 2009;77:1153-6.
2. Falidas E, Anyfantakis G, Vlachos K, Goudeli C, Stavros B, Villias C. Pneumoperitoneum, Retroperitoneum, Pneumomediastinum, and Diffuse Subcutaneous Emphysema following Diagnostic Colonoscopy. *Case Rep Surg* 2012;2012:108791.
3. Webb T. Pneumothorax and Pneumomediastinum During Colonoscopy. *Anaesth Intensive Care* 1998 Jun;26(3):302-4.
4. Fazeli MS, Keramati MR, Lebaschi AH, Bashashati M. Extensive Subcutaneous Emphysema Due to Colonic Perforation Following Colonoscopy. *J Coll Physicians Surg Pak* 2009 Jun;19(6):383-5.
5. Park NS, Choi JH, Lee DH et al. Pneumoretroperitoneum, Pneumomediastinum, Peumopericardium and Subcutaneous Emphysema after Colonoscopic Examination *Gut Liver* 2007 Jun;1(1):79-81.
6. Ho HC, Burchell S, Morris P, Yu M. Colon perforation, bilateral pneumothoraces, pneumopericardium, pneumomediastinum, and subcutaneous emphysema complicating endoscopic polypectomy: anatomic and management considerations *Am Surg* 1996 Sep;62(9):770-4.
7. Annaházi A, Polyák I, Nagy F, Wittmann T, Molnár T. "Ulcerative crepitus" - A case with subcutaneous emphysema and pneumomediastinum without colonic perforation or toxic megacolon in ulcerative colitis successfully treated conservatively. *J Crohns Colitis* 2012 Jul;6(6):717-9.
8. Mastrovich JD, Peters N, Tripathi A. Acute onset of facial swelling during colonoscopy in a 50-year-old woman. *Ann Allergy Asthma Immunol* 2004 Mar;92(3):307-12.
9. Goerg KJ, Duber C. Retroperitoneal, mediastinal and subcutaneous emphysema with pneumothorax after colonoscopy. *Dtsch Med Wochenschr* 1996 May 24;121(21):693-6.