Case Report

Feasibility of Loop Colostomy under Combined Spinal-epidural Anesthesia for Geriatric Patients: Five Case Reports from a Local Hospital

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Several comorbidities associated with general anesthesia (GA) for geriatric abdominal surgeries have been considered a difficult issue. Combined spinal-epidural anesthesia (CSEA) has therefore been proposed for many abdominal surgeries and has proven to provide a more stable circulation during surgery than did GA. Here, we present five elderly patients (> 80 years old) who received loop colostomy (LC) under CSEA at a local hospital. Three of them were diagnosed with left side colon tumor-related complications, whereas the other two had complicated anoperineal problems. All cases underwent a smooth, successful surgery without conversion to general anesthesia nor the use of inotropic agents perioperatively. Their postoperative consciousness was also clear without signs of delirium. Our series suggests that CSEA is safe and feasible for LC in selected geriatric patients.

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Societal aging remains a concern in developed countries, with estimates showing that more than 20% of the Taiwanese population would consist people over 65 years old by 2025.[1] Generally, geriatric individuals have polypharmacy, poorer heart and lung functions, and suffer more comorbidities than do younger populations. Moreover, they are more sensitive to general anesthesia (GA), which may predispose them to cardiac, pulmonary, or cognitive impairments. Elderly patients have a higher American Society of Anesthesiologist (ASA) score, which increases their suitability for several regional anesthesia (RA) methods. Spinal anesthesia (SA) and combined spinal-epidural anesthesia (CSEA) are common RA techniques for abdominal surgeries. CSEA, first proposed in the 1980s,[2] aimed to achieve a higher cephalad extension of the sensory block than does SA.[3] Compared to GA, CSEA causes less circulation variation during surgery and requires no endotracheal tube intubation. However, it also increases the difficulty due to spontaneous respiration or movement during surgery. Nonetheless, several abdominal surgeries have been conducted under CSEA.[4,5]

Loop colostomy (LC), a common procedure for stool diversion, is usually used for distal colon tumor obstruction, protection of distal side colon anastomosis, or certain anal problems. Although CSEA, SA, or local anesthesia (LA) has been used in several colo-

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rectal surgeries,[6-9] LC under CSEA has, to our knowledge, never been reported before. Here, we presented fives elderly patients (> 80 years old) who received LC under CSEA.

Case Presentation

All surgeries were performed by the same surgeon and anesthesiologist at the Veterans General Hospital, Taoyuan Branch from January 2021 to March 2022. Our patients' characteristics are detailed in Table 1, and their brief medical histories are described as follows.

Case 1

This case involved a 100-year-old man (ASA score: III) admitted to our hospital for acute on chronic abdominal pain lasting 1 week. He had a history of hypertension (HTN), chronic obstructive pulmonary disease, and second-degree atrioventricular (AV) block. After a series of examinations, he was diagnosed with distal transverse colon tumor with intestinal obstruction, for which colostomy for fecal diversion under CSEA was planned after shared decision making. The surgery was uneventful, and he was discharged on postoperative day (POD) 10 in good condition.

Case 2

This case involved a 97-year-old man (ASA score: III) diagnosed with rectosigmoid colon adenocarcinoma with multiple lung metastases at another hospital. He developed massive tumor bleeding with anemia. His comorbidities included HTN, chronic ischemic heart disease, and congestive heart failure (CHF), NYHA III. He underwent sigmoid LC under CSEA after the discussions and was smoothly discharged on POD 5.

Case 3

This case involved an 82-year-old woman (ASA score: III) with a history of dementia, HTN, type II diabetes mellitus, third-degree AV block and left breast carcinoma. She was sent to our hospital for vomiting, and abdominal pain. After a series of examinations were performed, she was diagnosed with rectal tumor with intestinal obstruction. After discussions with the family, they decided to undergo temporal transverse LC under CSEA. The surgery went smoothly, and she was transferred to the medical center for pacemaker implantation on POD5 in good condition.

Case 4

This case involved an 84-year-old man (ASA score: II) admitted to our hospital for urinary tract infection and anal glycerol ball injury. He had a history of Parkinson's disease, dementia with bed-ridden status, and CHF, NYHA III. He initially underwent debridement for perianal abscess under SA. However, stool incon-

Table 1. Five patients' characteristics

Case	Age	Gender	Comorbidities	ASA score	Diagnosis	Operation
1	100	M	HTN, 2nd AV block, COPD	III	Distal transverse colon tumor obstruction	Right side transverse LC
2	97	M	HTN, CAD, CHF	III	Rectosigmoid junction colon tumor with bleeding	Right side transverse LC
3	82	F	HTN, T2DM, breast cancer, dementia, 3rd AV block	III	Rectal tumor with obstruction	Right side transverse LC
4	84	M	Parkinson's disease, dementia	II	Glycerol ball injury with fecal incontinence	Sigmoid LC
5	84	F	Dementia, CHF	III	Grade IV sacral pressure sore, necrotizing fasciitis	Sigmoid LC

Gender M: male; F: female; ASA: America Society of Anesthesiologist; HTN: hypertension; AV block: atrioventricular block; COPD: chronic obstructive pulmonary disease; CAD: coronary artery disease; CHF: congestive heart failure; T2DM: type II diabetes mellitus; LC: loop colostomy.

tinence developed, which made wound care arduous due to stool contamination. After discussions with the family, the patient underwent sigmoid LC for fecal diversion under CSEA. The anal wound healed gradually, and other treatments for other medical problems were maintained.

Case 5

This case involved an 84-year-old woman (ASA score: III) who was admitted because of a large sacral pressure sore (grade IV) with peripheral necrotizing fasciitis. Her medical history included senile dementia with bed-ridden status for over 10 years. Although several fasciotomies and debridements were performed by other surgeons, the wound was easily contaminated by stool. She underwent elective sigmoid LC under CSEA. After a successful surgery, the pressure sore improved.

Surgical procedure

Three patients underwent sigmoid LC, whereas the other two underwent transverse LC. The surgical process was as follows. First, taking the umbilicus as the reference site, we measured the horizontal and vertical distances between the umbilicus and the target segment on abdominal computer tomography. Second, we marked the planned wound site over the skin by measuring its distance to the umbilicus. Third, a horizontal incision, 4 to 6 cm was made, and layer-by-layer dissection was performed using an electrosurgical blade until entering the peritoneal cavity. Fourth, we found and mobilized the target colon segment. The colon was then pulled out from the abdominal cavity. Fifth, a small window was created over the mesocolon, and a plastic rod was inserted through it. Lastly, the colon wall was opened, and maturation was performed by suturing the colon wall to the skin using a 3-O Vicryl suture.

CSEA procedure

This separate needle technique is described as follows. First, patients were placed in the lateral decubitus position with their knees to their chest, after which the third, fourth, and fifth lumbar spines were localized. The regional skin was sterilized and draped. Second, we used a spinal needle to penetrate the L4/5 interspinal space until the cerebrospinal space was reached. Bupivacaine hydrochloride (Marcaine Spinal 0.5%) 15 mg was then administered into the cerebrospinal fluid. Third, we used an epidural catheter (Perifix, B. Braun) to penetrate the L3/4 interspinal space until the epidural space was reached and left the catheter there. Meanwhile, we closely monitored the patient's heart rate and blood pressure to prevent bradycardia and hypotension. Lastly, the anesthesia level was assessed at approximately the T9-10 level. If the level is lower than optimal, 2% Xylocaine was titrated via the epidural route according to patient's blood pressure and pain sensation.

Discussion

This report details our experience with five elderly patients with comorbidities who successfully underwent LC under CSEA without conversion to GA. While most colorectal surgeries proposed by prior studies were elective, three of our cases underwent surgery under emergency settings.

For the operative procedure, we believe that preoperative localization of the target colon is most important. Once the incision site is determined, the distance from the wound to the target colon should be kept short, which also shortens the operative time. However, patients who had previously undergone abdominal surgery may have adhesions, possibly requiring enterolysis. Thus, LC under CSEA may not be appropriate due to possible prolonged operative time and poor visualization. Conversion is possible, so CSEA can't completely replace GA, just for selected cases. Hence, detailed preoperative explanation is necessary.

The anesthesia level of CSEA is determined by the type and the dose of medication used in Sam which is tailored based on patient's height, weight, and location of incision. Anesthesiologists should assess the anesthesia level before incision. In our series, the level should be close, or above xiphoid process (T7) for

transverse LC, and above umbilicus (T10) for sigmoid LC. The use of epidural anesthesia may enhance or reinforce the anesthesia effect. Aside from open surgeries, laparoscopic-assisted procedures under CSEA have also been reported.[5,10,11] Major abdominal surgeries, like colonic resection and nephrectomy, were performed in selected cases. Some researchers proposed SA with thoracic nerve block to prevent upper abdominal discomfort. The intraabdominal pressure needs to be decreased during laparoscopic surgeries. Compared to GA, the cost-effectiveness of CSEA is better. It usually offers less fees, and eliminates extubation during operation. It also reduces postoperative respiratory complications, which prolong hospitalization, leading to higher overall cost. Therefore, CSEA or other types of RA may become increasingly popular for patients not suitable for GA.

CSEA has some complications or risks, which are similar to those for SA and EA. A prior study[12] proposed several complications, such as spinal or epidural component failure, catheter misplacement or migration, subarachnoid spread of the drug, neurological damage, post-dural puncture headache, and infection. To prevent these complications, experienced anesthesiologists are important. Except for simple CSEA, combining other peripheral nerve block techniques improves the anesthesia effect.[13] Furthermore, better perioperative pain control also improves outcomes, which coincides with the trend of enhanced recovery after surgery.[14] There are some contraindications of CSEA, which are similar to SA, need to be mentioned. Absolute contraindications are patient refusal, elevated intracranial pressure, intracranial mass and infection sign over the procedure place. Other relative contraindications include preexisting neurological diseases, severe hypovolemia, and coagulopathy.

Conversely, prior research[15] has shown that surgeries conducted under CSEA could have reduced the need for endotracheal tube insertion, which could reduce possible COVID-19 virus spread given the pervasiveness of endotracheal tube insertion during the pandemic era. Furthermore, none of our patients used inotropic agents, which meant that CSEA provided more stable circulation during surgery than did GA. Finally, CSEA prevents GA-related postoperative delirium in elderly patients. In our series, every patient demonstrated clear cognitive function after LC. LC under LA might be an alternative option for elders, but CSEA provides better anesthesia effect while operations, especially in emergent setting.

Conclusion

Among the geriatric population, anesthesia for abdominal surgeries remains a daunting issue. Nonetheless, we believe that LC surgery under CSEA can be feasible for selected elderly patients.

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Conflicts of Interest

None.

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References

1. Republic of China (Taiwan) Population Estimates (2020-2027) report. National Development Council; 2020.
2. Abajian JC, Mellish RW, Browne AF, Perkins FM, Lambert DH, Mazuzan JE Jr. Spinal anesthesia for surgery in the high-risk infant. *Anesth Analg* 1984;63(3):359-62.
3. Ithnin F, Lim Y, Sia AT, Ocampo CE. Combined spinal epidural causes higher level of block than equivalent single-shot spinal anesthesia in elective cesarean patients. *Anesth Analg* 2006;102(2):577-80.
4. Uzman S, Donmez T, Erdem VM, Hut A, Yildirim D, Akinci M. Combined spinal-epidural anesthesia in laparoscopic appendectomy: a prospective feasibility study. *Ann Surg Treat Res* 2017;92(4):208-13.

5. Singh RK, Saini AM, Goel N, Bisht D, Seth A. Major laparoscopic surgery under regional anesthesia: a prospective feasibility study. *MJAFI* 2015;71(2):126-31.
6. Imbelloni LE, Fornasari M, Fialho JC. Combined spinal epidural anesthesia during colon surgery in a high-risk patient: case report. *Rev Bras Anestesiol* 2009;59(6):741-5.
7. Abreu RA, Vaz FA, Laurino R, Speranzini MB, Fernandes LC, Matos D. Randomized clinical trial comparing spinal anesthesia with local anesthesia with sedation for loop colostomy closure. *Arq Gastroenterol* 2010;47(3):270-4.
8. Yong YP, Bhandal N, Scholefield J. How to do a trephine colostomy under spinal anaesthesia. *ANZ J Surg* 2014;84(11): 881.
9. Atilla Tutak ÖU, Bahattin Pektaş M, Kaya R, Doğukan M, Şahin Tutak A. Combined spinal epidural anesthesia in a geriatric patient undergoing Hartmann colostmy. *Gerontol Geriatr Med* 2019;5(2).
10. Mehta N, Gupta S, Sharma A, Dar MR. Thoracic combined spinal epidural anesthesia for laparoscopic cholecystectomy in a geriatric patient with ischemic heart disease and renal insufficiency. *Local Reg Anesth* 2015;8:101-4.
11. Santoro E CL, Pedullà G, Pullano C. Spinal and epidural anesthesia for laparoscopic abdominal surgery: 84 procedures. *World J Surg* 2021;4:1334.
12. Ong KB, Sashidharan R. Combined spinal–epidural techniques. *BJA Education* 2007;7(2):38-41.
13. Yarwood J, Berrill A. Nerve blocks of the anterior abdominal wall. *BJA Education* 2010;10(6):182-6.
14. Ripollés-Melchor J, Ramírez-Rodríguez JM, Casans-Francés R, Aldecoa C, Abad-Motos A, Logroño-Egea M, et al. Association between use of enhanced recovery after surgery protocol and postoperative complications in colorectal surgery: The Postoperative Outcomes Within Enhanced Recovery After Surgery Protocol (POWER) Study. *JAMA Surg* 2019; 154(8):725-36.
15. Major AL, Jumaniyazov K, Yusupova S, Jabbarov R, Saidmamatov O, Mayboroda-Major I. Laparoscopy in gynecologic and abdominal surgery in regional (spinal, peridural) anesthesia, the utility of the technique during COVID-19 pandemic. *Medicines* 2021;8(10).

病例報告

老年病患於合併脊髓及硬膜外麻醉下接受環狀結腸造口手術的可行性 — 一個地區醫院的五位病例報告

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對於老年病患腹腔手術而言，全身麻醉有許多共病症。「合併脊髓及硬膜外麻醉」被應用在許多腹腔手術，而此技術也被證實比起全身麻醉能提供更穩定的循環狀況。在此，我們報告在某地區醫院有五名老年病患 (大於 80 歲) 皆於「合併脊髓及硬膜外麻醉」下接受環形結腸造口手術。其中三名被診斷左側結腸腫瘤相關併發症，另外兩名則診斷有複雜的肛門會陰疾病。所有病人的手術過程都十分順利且沒有轉換成全身麻醉或使用任何升壓劑。病患們手術後的意識狀況都十分清楚沒有任何譫望現象。此系列病例顯示「合併脊髓及硬膜外麻醉」應用在老年人環形結腸造口手術是安全且可行的方式。

關鍵詞 合併脊髓及硬膜外麻醉、環形結腸造口、老年學。