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Case Report
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THE IMPACT OF POSTOPERATIVE DELIRIUM

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Abstract

Delirium is a common complication after surgery, especially among critically ill patients. The etiology is multifactorial and the condition is frequently identified after major complicated surgery. It is associated with prolonged hospital stay and increased morbidity and mortality.
This paper present a complex case which required intensive treatment and support as a result of several complications including delirium. The case also serves a good example in discussing the different aspects of the condition.

Introduction

Delirium is an acute cerebral state occurring in a setting of physiological derangement, which is caused by a co-existing medical disorder in the presence of precipitating factors. It is characterized by disturbed con-sciousness and cognitive dysfunction that presents over a short period of time and has a fluctuating course[1-3].

The word Delirium is thought to be derived from the Latin delirare, which means "to be out of one's furrow (trench, which is a long narrow ditch)"[2]. It is a common condition affecting 15% and 60% of medical and surgical inpatients[4]. Although the incidence is high after major complicated surgery[5,6], it is rarely seen after minor surgery[7]. Although it can be prevented in about 1/3 of patients at risk, it is often poorly recognized[8]. Recognizing risk factors and determining the possible etiology, is always the first step in managing the condition, and treating the underlying cause may be curative[4].

Case report

AW, a 57 year old female patient admitted to the hospital in June 2009 under the care of another surgical team with acute lower left abdominal pain and tenderness. She is a short and thin woman. A CT scan confirmed the clinical diagnosis of acute sigmoid diverticulitis. She was treated with intravenous antibiotics and other supporting measures. Her condition was brought to a control and an early colonoscopy was not tolerated despite gentle introduction of the scope. Significant diverticular disease was noted and this was confirmed by CT Colonography. Because of her long-standing pain and recurrent infection, she was offered surgical resection of the involved colon, which was scheduled as an elective procedure. Shortly after discharge from the hospital, the patient presented in September 2009 to another nearby hospital to where she is living with acute abdominal pain and found to have peritoneal irritation. An emergency laparotomy confirmed a perforated acute sigmoid diverticulitis. Hartman's procedure was performed followed by

slow recovery. The patient subsequently referred back to the original hospital to reverse the bowel continuity in due time. The author took over her care in March 2010. The patient who is known to have Chronic Obstructive Pulmonary Disease (COPD) is on regular medications, was very keen to reverse the previous Hartman's procedure. After assessment and retrieving the clinical documents from the other hospital, the procedure was performed on 29/3/2010. At exploration it was discovered that the previous surgeon removed all the sigmoid colon, and mobilized the distal part of the descending colon and upper rectum. The rectal stump was identified posterior to the uterus, which was adherent to the promontory of the sacrum. In order to be able to bring the colon end to the pelvis the whole left colon from the left side of the transverse colon, the splenic flexure and the entire descending colon was mobilized. It was also found that despite of anal dilatation a sufficiently wide circular stapler (30.0mm or 28.0mm) was not able to be pass through the rectum. Therefore a stapler size of 25.0mm was passed but because of the fibrosis at the rectal stump the colorectal anastomosis was performed below the level of the stump. The anastomosis looked satisfactory with no leak. However, because of the extensive mobilization of the colon and the repeated manipulation through the rectum the patient was given a temporary loop ileostomy. After an initial good recovery the patient passed through a period of confusion and hallucination, which we were unable to relate to a specific cause. Fortunately the patient's general condition improved and she was able to be discharged home where she lives with a husband. At this stage she was not willing to give any information about other family members. Four weeks later a Gastrografin enema was performed, which showed no anastomotic leak and an incompetent ileocaecal valve as shown by a retrograde flow of the contrast to the ileum. When she was subsequently seen was looking unwell, which she attributed to social and personal problems in particularly taking extra care of her chronically ill husband. Because of that the reversal of the loop ileostomy was delayed to 28/6/2010, which was a straightforward procedure. The patient was allowed to resume gradual oral intake after recovery as tolerated. On postoperative day one and most of day two she was comfortable, tolerated the oral intake and passed wind. However, later on day two her condition dramatically changed when she developed abdominal distension, which became very tense over the next few days. In addition she continued to pass frequent, yellowish, liquid bowel motions but continued to have normal vital signs and fairly normal blood tests. Faeces were negative for Clostridium Difficile (CD) and other relevant organisms. A double-lumen per-cutaneous central venous line through the arm was inserted. The patient was kept well hydrated and supported including the administration of Total Parenteral Nutrition (TPN), and oxygen inhalation, but became increasingly uncooperative and confused. An urgent colonoscopy was performed, which surprisingly showed an extensive, severe, colitis involving the entire colon but sparing the rectum. The colon was dilated, severely inflamed with multiple ulcers covered with purulent and necrotic material. This was an unexpected complication. No specific cause could be determined because it didn't fit with any clinical category. While waiting for the histology of the multiple biopsies taken, the patient was given intravenous Metronidazole and oral Pentasa. The histopathology diagnosis was thought to be consistent with severe Diversion Colitis. Therefore intravenous Hydrocortisone was started,

which gave an improvement in the general condition including the regression in the abdominal distension and the frequent bowel movements. However, the patient continued to be delirious and committed several strange acts. The patient was cared with a nurse allocated totally to her, she was reviewed by the medical and psychiatric teams, and then we discovered that she has family members living in another city. We sought help from them who informed us among other things that the patient is a heavy (wine) drinker taking it all through the day. Therefore alcohol withdrawal was thought to be an additional contributing factor to her delirium, and was treated according to the hospital protocol.

Suddenly, on 6/7/2010 the patient went into a state of hypotension and hypoxia. She was resuscitated in the Intensive Care Unit (ICU) and her WCC count among other items was found to be 35X10(g)/L (Normal range 4.0-11.0). A diagnosis of Acute Toxic Megacolon was made and once the general condition became stable an emergency total colectomy with disconnection of the previous colorectal anastomosis and formation of end ileostomy was performed (Fig 1-3). The patient tolerated the procedure well, was kept intubated and transferred back to the ICU. She tolerated the endotracheal tube very well in a reasonable awake status with minimal sedation. Initially she was kept on 70% O2 saturation, dropped gradually to 35% when a decision was taken to extubated her. Although she was maintained on high O2 inhalation she developed periods of low O2 saturations, in the 80s percent. Three days later she went into acute respiratory failure and was intubated again, which was continued for three days before extubation. She was also found to have inability to move the right arm and leg. A CT scan to the brain confirmed an infarct area in the left frontal lobe. Full support continued including treatment of chest infection and pneumonia. The TPN was changed to Enteral Nutrition (EN) because her gastrointestinal tract could be fully utilised. During this period of time she was significantly confused, could not recognize the familiar people around her and sometimes was aggressive. Over the following week the patient's condition gradually improved and became more oriented and accepting oral intake, eating with her left hand despite she was right-handed. She gained movement in her right arm but not the right leg, and the chest infection well controlled. Eventually she was transferred to the rehabilitation ward under the prime care of the physicians. The general condition of the patient continued to improve until she returned back to her normal attitude and orientation. The movement in her right arm gained significant improvement and a promising movement of the right leg was also noticed.

The histology of the colon could not be confidently determined due to the significant changes, and distinction between severe ischemic and infectious colitis was not possible. Stains for fungal infection were negative and there were no viral inclusions. Gram stain showed mixed bacterial flora with predominant gram positive bacteria.

Differential diagnosis of delirium

Delirium is a state of acute brain failure characterized by disturbances of consciousness, attention, cognition, and perception that cannot be accounted for by past or evolving dementia and is associated with evidence of physiological disturbance related to a medical condition[3]. The differential diagnosis of delirium requires information related to symptoms; temporal onset; and physical,

neurological, and mental status examination, in addition to the results of the radiological and laboratory tests[9].

Acute alcohol withdrawal is often difficult to distinguish from postoperative delirium because of symptom overlap.

Dementia can be difficult to distinguish from delirium, and delirium superimposed on dementia has a prevalence ranging from 23% to 89%[10].

Hypoactive delirium is often misdiagnosed as depression as some overlap of symptoms occurs[2]. While agitation in hyperactive delirium is often related to fear either caused or accompanied by symptoms of psychosis[2].

This patient showed classic clinical features of hyperactive postoperative delirium in particularly with each sudden change or deterioration in her general condition status. We were unaware about her long and significant alcohol indulge, which contributed to her presentation. Although we initially suspected an alcohol withdrawal syndrome but because of the major precipitating factors we think that the behavior and attitude were consistent with delirium.

Risk factors

Several investigators identified several preoperative risk factors for postoperative delirium. These include age greater than 70 years, self-reported alcohol abuse, poor cognitive status, poor functional status, abnormal serum levels of sodium, potassium, and glucose, non-cardiac thoracic surgery, abdominal aneurysm surgery, dementia, tobacco use, depression, and an albumin level $\leq$4.0 g/dl[11,12]. Intraoperative risk factors include blood loss and the need for fluid infusion[13].

Our patient's respiratory status as a result of her pre-existing COPD, and the development of pneumonia with periods of drop in O2 saturation coupled with the septic status from the acute toxic megacolon and its associated metabolic derangement were the main risk factors contributed to her delirium.

Attempts to prevent delirium

Having identified several risk factors for postoperative delirium, a trial conducted by Marcantonio and co-workers[14] demonstrated the effectiveness of implementation of the recommendations from geriatrics consultation service. There was a reduction in the incidence of delirium from 50% in the control group to 32% in the intervention group, and the incidence of severe delirium was also reduced from 29% to 12% in the control and intervention groups respectively.

Pathogenesis of delirium

Delirium is often multifactorial in origin, likely affecting multiple centers of the central venous system[3]. A recent hypothesis suggesting a deficiency in the cholinergic pathways may be one of the underlying factors[15].

Hypoxia, hypoglycaemia, electrolyte imbalances, fluid depletion, and drug interactions commonly contribute to the development of delirium[2,3]. Uncontrolled postoperative pain and overuse of narcotics can exacerbate delirium. Prolonged postoperative immobilization of patients and patients with underlying dementia are additional contributing factors[2,3].

Management of delirium

Evaluation of possible etiological conditions or factors including pharmacological agents is the initial step in the management. Elimination of any possible causes and providing supportive care can be corrective[2,3,14]. Pain control is an important issue, particularly in the elderly, postoperative patients. Post-operative nausea is another common symptom that requires adequate treatment to avoid prolonged periods without proper nutrition. Adequate oxygen delivery to tissues and

maintenance of fluid and electrolytes balance are essential. Medications need to be reviewed and adjusted, and early mobilization of the patient is encouraged. Attention should be paid to maintain a regular and normal bowel and bladder function. Elderly patients are at greater risk for developing postoperative cardiac and pulmonary complications, which need to be monitored and treated accordingly. In order to optimize interaction with an unfamiliar environment, vulnerable patients in particularly the elderly should be provided with their assistive devices and reorientation facilities.

The surgeon might find it necessary to seek opinion and help from colleagues geriatricians and/or psychiatrists who are able to provide additional treatment with medications, many of them, specifically "Haloperidol" are widely studied in the treatment of delirium.

Conclusion

Postoperative delirium is an important condition with significant associated morbidity and mortality, especially in the elderly. Despite preventive efforts there are certain groups of patients who will develop delirium. Identifying risk factors and treating underlying causes remains the mainstay of management. Multidisciplinary management of high risk patients has resulted in decreased incidence of delirium, including the type associated with severe agitation, which is the most challenging type that psychiatrists are confronted with in the general hospital.

References

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th edition, Text Revision (DSM-IV-TR). Washington DC, American Psychiatric Association, 2000.
2. Fricchione GL, Nejad SH, Esses JA, et al: Postoperative Delirium. Am J Psychiatry 2008;165(7):803-812.
3. Flinn DR, Diehl KM, Seyfried LS, Malani PN: Prevention, Diagnosis, and Management of Postoperative Delirium in Older Adults. J Am Coll Surg 2009; 209(2):261-268.
4. Ely EW, Siegel MD, Inouye SK: Delirium in the intensive care unit: an underrecognized syndrome of organ dysfunction. Semin Resp Crit Care Med 2001;22:115-126.
5. Schneider F, Böhner H, Habel U, et al: Risk factors for postoperative delirium in vascular surgery. Gen Hsop Psychiatry 2002;24:28-34.
6. Marcantonio E, Ta T, Duthie E, Resnick NM: Delirium severity and psychomotor types: their relationship with outcomes after hip fracture repair. J Am Geriatr Soc 2002;50:850-857.
7. Milstein A, Pollack A, Kleimman G, Barak Y: Confusion/delirium following cataract surgery: an incidence study of 1-year duration. Int Psychogeriatric 2002;14:301-306.
8. National Clinical Guideline centre. Delirium, diagnosis, prevention and management. NCGC, 2010. www.nice.org.uk/CG103.
9. Marcantonio E: The management of delirium, in Delirium in Old Age. Edited by Lindsay J, Rockwood R, Macdonald A. Oxford, UK, Oxford University Press, 2002, pp 123-151.
10. Fick DM, Agostini JV, Inouye SK: Delirium superimposed on dementia: a systematic review. J Am Geriatr Soc 2002; 50:1723-1732.
11. Marcantonio ER, Goldman L, Mangione CM, et al: A clinical prediction rule for delirium after elective noncardiac surgery. JAMA 1994; 271: 134-139.
12. Rudolph JL, Jones RN, Rasmussen LS, SilversteinJH, Inouye SK, Marcantonio ER: Independent vascular and cognitive risk factors for postoperative delirium. Am J Med 2007; 120: 807-813.
13. Marcantonio ER, Goldman L, Orav EJ, Cook EF, Lee TH: The association of intraoperative factors with the development of postoperative delirium. Am J Med 1998; 105: 380-384.
14. Marcantonio ER, Flacker JM, Wright RJ, Resnick NM: Reducing delirium after hip fracture: a randomized trial. J Am Geriatr Soc 2001;49:516-522.
15. Hshieh TT, Fong TG, Marcantonio ER, Inouye SK: Cholinergic deficiency hypothesis in delirium: a synthesis of current evidence. J Gerontol A Biol Sci Med Sci 2008;63:764-772.