Availability of Early, Intensive, and Continuous Nutrition Management for Fournier's Gangrene with Rectal Cancer: A Case Report

FOURNIER'S GANGRENE, REported by Fournier in 1883,[1,2] is a necrotizing fasciitis occurring and rapidly and progressively expanding in the external genitals and the perineum of subcutaneous tissue.[3] Recommended treatment involves single or combined therapy using antimicrobial agents, surgical debridement, and hyperbaric oxygen; however, despite treatment, the disease has a poor outcome with up to 40% mortality rate.[4-6] It is critical to intervene with appropriate treatment in the early phase. Regarding comorbidity, 10% to 60% of patients present with diabetes[4] and 2% to 4.2% of patients present with rectal cancer.[4,6] Fournier's gangrene with rectal cancer necessitates both treatment of necrotizing fasciitis and cancer surgery in the same period of the clinical course.[7]

The nutrition management of patients with Fournier's gangrene as well as rectal cancer is unclear[8]; nevertheless, nutrition management of these patients is obviously critical because of patient requirements for infection control, surgery, and oncologic treatment. During a PubMed search conducted April 7, 2015, 28 articles were found by entering the search terms *Fournier's gangrene* AND *rectal OR colorectal* AND *cancer OR carcinoma*. Only three of the 28 articles included information on nutrition therapy.

Here we describe a case of Fournier's gangrene with rectal cancer; the patient showed a good clinical course after we performed early intensive nutrition management from the onset and underwent nutrition management for the support treatment of rectal cancer.

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CASE PRESENTATION

Patient Profile

A 71-year-old man with a history of bleeding piles for more than 1 year presented to the emergency department after 4 days of reddening and swelling of the perineum, fever, hyposthenia, and ambulation difficulty. The patient had no history of diabetes.

Diagnosis

Physical examination showed expansive gangrene of the skin and soft tissues from the perineum to the lower abdominal region. Computed tomography revealed swelling, diffuse increased density, fluid retention, and a subcutaneous gas reservoir in the lower abdomen from 2 cm under the umbilicus to the scrotum. The patient was diagnosed with Fournier's gangrene, receiving 10 points on Fournier's gangrene severity index score.[9]

The laboratory findings were white blood cell count 31.0×10^9/L, C-reactive protein 19.4 mg/dL (1,847.66 nmol/L), hemoglobin 6.5 g/dL, total protein 5.5 g/dL, albumin 1.5 g/dL, total lymphocytes 465/μL, blood urea nitrogen 51.8 mg/dL (18.49 mmol/L), and creatinine 1.82 mg/dL (160.89 μmol/L) (Table 1).

Sequential Organ Failure Assessment score[10] was 4, and the acute physiology and chronic health evaluation II score[11] was 16.

Treatment

After admission, debridement of the necrotic tissue from the lower abdomen and scrotum was immediately performed, and subsequently the patient was treated in the intensive care unit with mechanical ventilation. Bacteriologic examination revealed *Bacteroides fragilis* in the surgical specimens and hence antibiotics were administrated for 8 days after the operation.

Nutrition Assessment

Anthropometric measurements revealed the following: height 178 cm, body weight uncertain, usual body weight 70 kg, ideal body weight (IBW) 69.7 kg, arm circumference 22.7 cm, triceps skinfold thickness 10 mm, and arm muscle circumference 19.6 cm. The patient was diagnosed with severe malnutrition according to the 16 points of the Patient-Generated Subjective Global Assessment.[12] Energy expenditure was increased because of surgery and advanced inflammatory reaction.

Nutrition Intervention

On Hospital Day 3, peripheral parenteral nutrition was initiated with glucose, amino acids, and electrolytes

(840 kcal, 60 g amino acids, electrolytes, and 2,000 mL water); on the next day, total parenteral nutrition (1,120 kcal, 240 g glucose, 40 g amino acids, electrolytes, and 1,800 mL water) was initiated with supplemental enteral nutrition (400 kcal, 17.5 g protein, vitamins, electrolytes, and 340 mL water). Because excessive inflammation persisted, the initial energy target was 1,400 kcal (20 kcal/kg) and the protein target was 84 to 140 g (1.2 to 2.0 g/kg IBW/day) according to the guidelines of the European Society for Clinical Nutrition and Metabolism[13,14] and the American Society for Parenteral and Enteral Nutrition[15]; the planned energy goal was 2,100 to 2,450 kcal/day (30 to 35 kcal/kg IBW/day). Until Hospital Day 11, the administered energy gradually increased up to 50 kg/kg IBW/day, whereas inflammatory signs decreased (Figure 1).

On Hospital Day 5, oral intake was initiated. We supplemented with parenteral nutrition because oral intake was insufficient. On Hospital Day 11, an oral nutritional supplement containing arginine and zinc was provided until Day 72 to promote wound healing.[16,17]

On Hospital Day 15, additional debridement and skin grafting was performed. After skin grafting, enteral nutrition was reinitiated because the patient was sedated to prevent desquamation of the skin graft.

On Hospital Day 20, the administered energy reached a level of 3,440 kcal (49.4 kcal/kg IBW/day), and the administered protein level achieved 174 g (2.5 g/kg IBW/day); the blood glucose level was not a problem.

A thick bore catheter was placed through the anal canal to drain excretions and prevent wound contamination. On Hospital Day 22, oral intake was reinitiated with parenteral nutrition instead of tube feeding. On Hospital Day 24, the skin graft had been integrated without any infectious complications.

On Hospital Day 26, the nutrition plan was changed to include 1,500 to 1,800 kcal/day (30 to 35 kg/kg/day) energy, and 61 to 76 g (1.2 to 1.5 g/kg/day) protein based on actual body weight. On Hospital Day 34, the target nutritional intake could be fulfilled by oral ingestion alone. On Hospital Day 40, the patient was moved to a general hospital ward.

On Hospital Day 13, melena was observed. Rectal cancer was identified at Day 40. On Hospital Day 74, Miles' operation,[18] which refers to rectal amputation, was performed. The cancer was classified as T3 N2b M1b (stage IV) by pathologic examination based on the TNM classification defined by the Union for International Cancer Control. On Hospital Day 78, oral intake was reinitiated with a goal of 1,500 to 1,800 kcal/day (30 to 35 kcal/kg/day), including a protein level of 61 to 65 g (1.2 to 1.25 g/kg/day). On

Table 1. Laboratory data on admission and at the third day of hospitalization for a 71-year-old man diagnosed with Fournier's gangrene

	On admission	Day 3 of hospitalization
Total protein (g/dL)	5.5	4.8
Albumin (g/dL)	1.5	1.7
Uric acid (mg/dL)[a]	9.8	4.5
Blood urea nitrogen (mg/dL)[b]	51.8	18.2
Creatinine (mg/dL)[c]	1.82	1.03
Estimated glomerular filtration rate (mL/min/1.73 m^2)	30	55
Total cholesterol (mg/dL)[d]	60	—
Triglyceride (mg/dL)[e]	74	—
Total bilirubin (mg/dL)[f]	1.0	4.5
Aspartate aminotransferase (U/L)[g]	31	23
Alanine aminotransferase (U/L)[h]	25	—
Alkaline phosphatase (U/L)[i]	530	321
Gamma-glutamyl transferase (U/L)[j]	57	—
Cholinesterase (U/L)[k]	67	—
Lactate dehydrogenase (U/L)[l]	170	148
Creatine kinase (U/L)[m]	11	42
Amylase (U/L)[n]	35	37
Glucose (mg/dL)[o]	93	104
Glycated hemoglobin (%)	5.6	—
Sodium (mmol/L)	136	137
Potassium (mmol/L)	5.4	4.7
Chloride (mmol/L)	103	106
Calcium (mg/dL)[p]	7.3	6.7
C-reactive protein (mg/dL)[q]	19.4	12.2
White blood cells ($\times 10^9$/L)	31.0	13.4
Red blood cells ($\times 10^{12}$/L)	32.0	36.7
Hemoglobin (g/dL)	6.5	9.7
Hematocrit (%)	20.9	28.3
Mean corpuscular volume (fL)	65.3	77.1
Mean corpuscular hemoglobin (pg/cell)	20.3	26.4
Mean corpuscular hemoglobin concentration (%)	31.1	34.3
Platelet count ($\times 10^{12}$/L)	3.1	1.8

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