Palliative Care Rounds

Mechanical Thrombectomy for Trousseau Syndrome in a Terminally Ill Cancer Patient

Naoto Kuroda, MD, Hisaya Hiramatsu, MD, Masanori Mori, MD, and Tokutaro Tanaka, MD, PhD
Department of Neurosurgery (N.K., T.T.), Seirei Hamamatsu General Hospital, Hamamatsu; Department of Neurosurgery (H.H.), Hamamatsu University School of Medicine, Hamamatsu; and Palliative Care Team (M.M.), Seirei Mikatahara General Hospital, Hamamatsu, Japan

Abstract

Trousseau syndrome was first described by Armand Trousseau in 1865 and is characterized by hypercoagulation resulting from malignant tumors. This complication can markedly impact quality of life (QOL). This is the first report of a terminally ill patient who developed large-vessel occlusion stroke from Trousseau syndrome and underwent mechanical thrombectomy. A 75-year-old woman presented with Stage IV ovarian cancer. Goals of care were transitioned to palliative care. The patient was hospitalized with vertebral compression fracture and suddenly developed right hemiparesis and total aphasia during admission. Magnetic resonance imaging and angiography showed occlusion of Segment 1 of the left middle cerebral artery. We administered tissue-plasminogen activator, but symptoms remained unimproved. We performed mechanical thrombectomy based on medical indications and with the consent of her family. Thrombectomy improved symptoms dramatically. She was able to walk and talk with her family at discharge. She eventually died of respiratory failure on postoperative Day 98, but QOL remained high for those 98 days. Mechanical thrombectomy has the potential to markedly improve QOL in terminally ill patients with large-vessel occlusion associated with Trousseau syndrome. J Pain Symptom Manage 2019;57:688–694. © *2018 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.*

Key Words

Mechanical thrombectomy, ovarian cancer, Trousseau syndrome, end of life, aggressive care, supportive care, terminally ill, quality of life

Introduction

Terminally ill patients are often at risk of multiple complications. Knowing how aggressively to manage these complications is very challenging because no consensus has been reached regarding whether treatment should be withdrawn or withheld.[1–4] We have to make treatment decisions with due consideration of the benefits, risks, effects on comfort, preferences of the patient and family, and the course of any previous treatment.[5]

Trousseau syndrome is a common cause of ischemic stroke in cancer patients.[6] This syndrome was first reported by Armand Trousseau in 1865 and is characterized by hypercoagulation disorder in patients with malignancy.[7,8] This complication can markedly affect quality of life (QOL).

Mechanical thrombectomy is an effective clot-removing treatment for patients with acute cerebral infarction due to large vessel occlusion (LVO). However, thrombectomy for Trousseau syndrome has only rarely been described,[6,9,10] and no cases have yet been reported among terminally ill patients.

This is the first report to describe the successful use of mechanical thrombectomy to rescue a terminally ill patient with LVO due to Trousseau syndrome. Mechanical thrombectomy dramatically improved patient QOL and activities of daily living.[11–15]

Case Description

The patient was a 75-year-old woman who underwent chemoradiotherapy for Stage IV ovarian cancer (serous adenocarcinoma, high grade) as outpatient.

Address correspondence to: Naoto Kuroda, MD, Seirei Hamamatsu General Hospital, 2-12-12 Sumiyoshi, Nakaku, Hamamatsu, Shizuoka 430-8558, Japan. E-mail: kurodanaoto218@gmail.com

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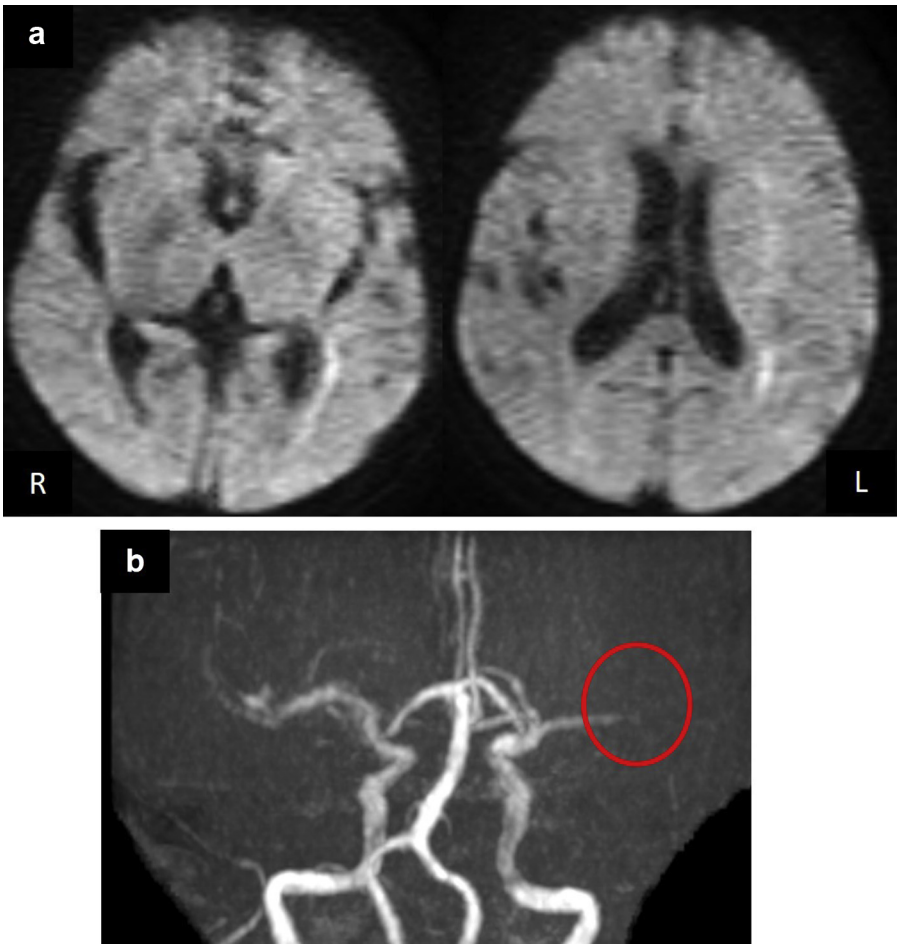

Fig. 1. MRI/MRA study on the development of right hemiparesis and aphasia including a) MR-DWI showing DWI-ASPECTS of 8, meaning that almost all areas of left MCA were not infarcted but represented penumbra and b) MRA showing that left MCA was occluded at the red circled point. ASPECTS = Alberta Stroke Program Early Computed Tomography Scores; DWI = diffusion-weighted imaging; MCA = middle cerebral artery; MRA = magnetic resonance angiography; MRI = magnetic resonance imaging. (For interpretation of the references to color in this figure legend, the reader is Referred to the web version of this article.)

Despite the chemoradiotherapy, the cancer progressed and showed metastasis to axillary, cervical, mediastinal, and supraclavicular lymph nodes. She developed severe adverse effects (gastrointestinal symptoms) that prevented continuation of chemoradiotherapy. We considered her treatment plan including hospice; however, she wished to spend peacefully the rest of her life at her home with her husband with palliative care follow-up as outpatient. Based on this wish, the goals of care were transitioned to palliative care, focusing on symptom alleviation and maintenance of QOL.

However, after 43 days from this decision, the patient was admitted to our hospital with vertebral compression fracture. Sixteen days after admission, deep venous thromboses developed in bilateral soleal veins in association with immobility, and edoxaban was initiated at 30 mg/day. Palliative prognostic score was 1.0 and Palliative Prognostic Index was 2.5, indicating an estimated survival of a few months rather than weeks. On Day 21 of this admission, she suddenly developed right hemiparesis and total aphasia. National Institutes of Health Stroke Scale (NIHSS) score was 18, and blood examination showed an elevated concentration of D-dimer (6.5 μg/mL). Electrocardiography showed no atrial fibrillation. We performed magnetic resonance imaging and magnetic resonance angiography, followed by administration of tissue-plasminogen activator (t-PA) and performance of mechanical thrombectomy.

Magnetic resonance imaging/magnetic resonance angiography showed occlusion of Segment 1 of the left middle cerebral artery (MCA) and Diffusion-Weighted Imaging–Alberta Stroke Program Early Computed Tomography Scores (ASPECTS) of 8 (Fig. 1). At 3.8 hours after onset, we administered

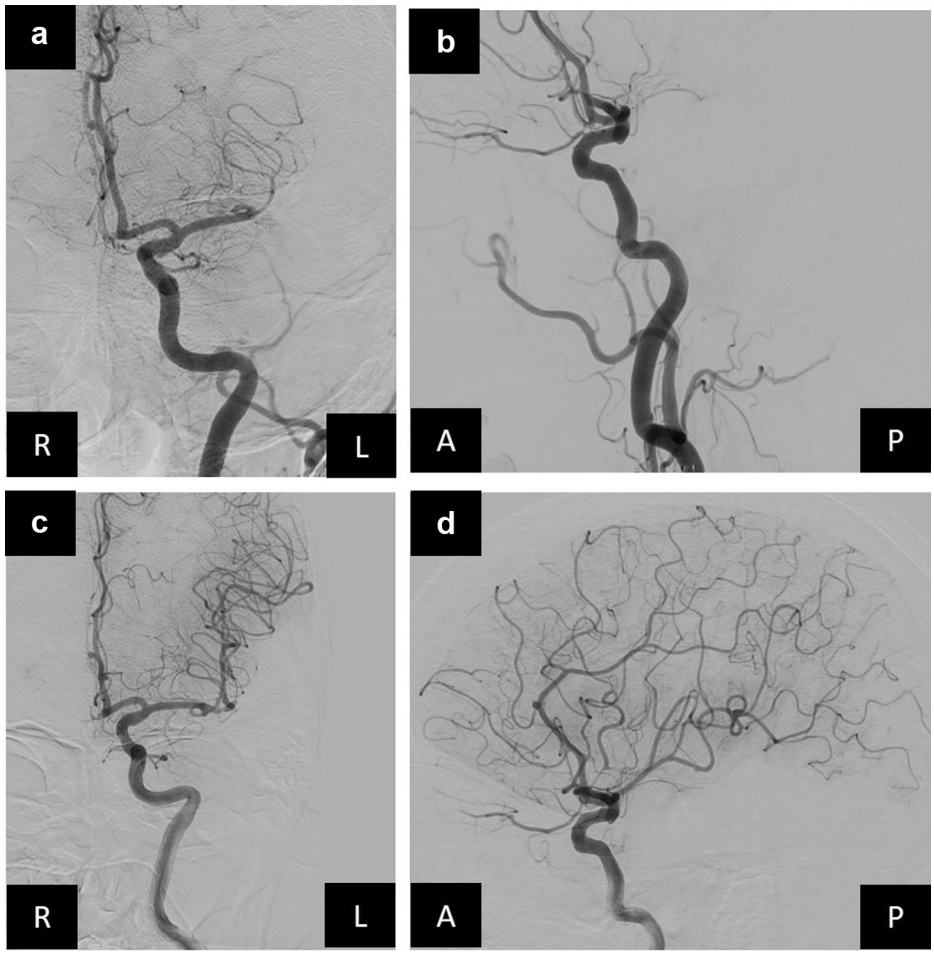

Fig. 2. Angiographic findings for mechanical thrombectomy. a and b) Angiography before thrombectomy showing left M1 occlusion from an anteroposterior view (a) and lateral view (b). c and d) Angiography after thrombectomy showing recanalization of almost of all the occluded left M1 (TICI 2b). Anteroposterior view (c) and lateral view (d). M1 = middle cerebral artery segment 1; TICI = Thrombolysis in Cerebral Infarction scale.

t-PA (0.6 mg/kg), but symptoms remained unimproved. Based on the timing (i.e., within 8 hours), severity, and persistence of symptoms despite t-PA, and high Diffusion-Weighted Imaging—ASPECTS with LVO, thrombectomy was considered indicated. Given the rapid functional deterioration and failure of medical treatment, we held prompt but comprehensive discussions with the patient's oncologist, nurses, and family to discuss mechanical thrombectomy as a potential treatment option. The family also wanted their loved one to regain the capacity for communication. We considered that the potential benefit (improvement of neurological deficits) outweighed the risks (possibility of complications from treatment), determined that the procedure would be consistent with the patient's prestroke wish to spend peacefully with her husband, and obtained consent from her family on behalf of the patient. The prestroke mRS was 4 due to vertebral compression fracture; however, this state was considered temporary and predicted to recover to mRS 0 or 1. We thus concluded that thrombectomy would be appropriate, even in the setting of this terminally ill patient receiving best supportive care. We performed mechanical thrombectomy based on the medical indications and consent from the family.

We made three attempts at passing using a stent-retrieval device (Trevo 3*20 mm; Stryker, Fremont, CA) and an aspiration device (Penumbra 5MAX ACE; Penumbra, Alameda, CA). The third attempt succeeded in removing three thrombi (3 mm, 4 mm, and 5 mm in diameter), and recanalized the occluded vessel. Thrombolysis in Cerebral Infarction scale classification was 2b, indicating complete filling of all the expected vascular territory, but with slower filling than normal (Fig. 2). The interval from onset to recanalization was 7.3 hours. Thrombus pathology included mainly fibrin, with no tumor cells (Fig. 3).

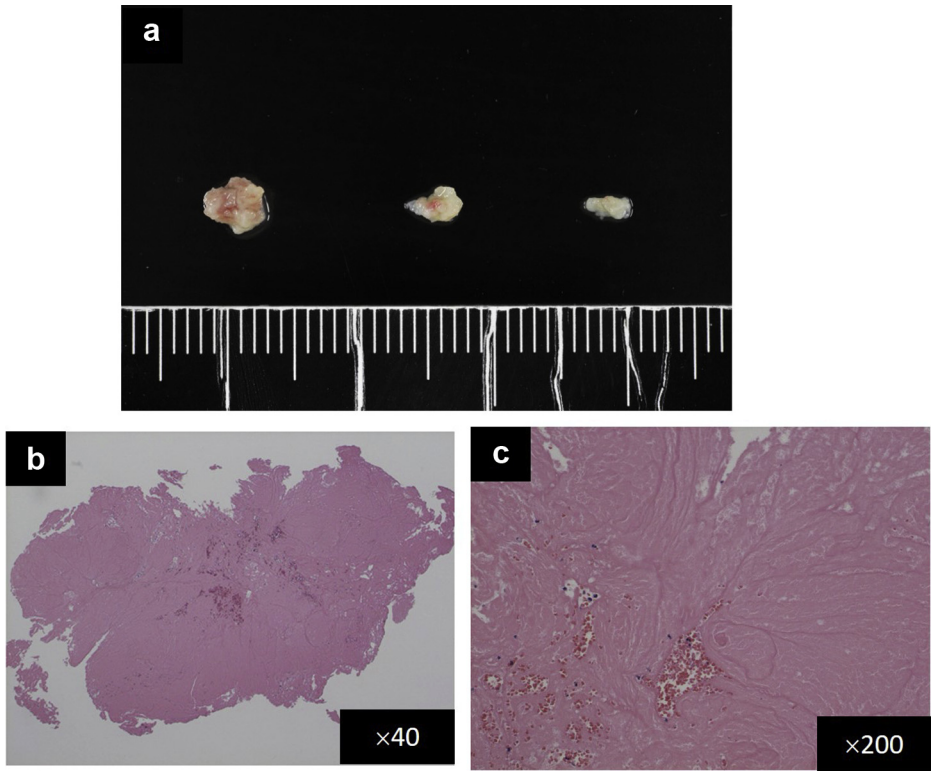

Fig. 3. Thrombi and macroscopic and microscopic findings. a) Three thrombi removed by thrombectomy are white in coloration, with diameters of 5 mm, 4 mm, and 3 mm. b and c) HE stains of thrombus. These thrombi consist of fibrin without tumor cells. Low-power field (b) and high-power field (c).

Thrombectomy dramatically improved symptoms (NIHSS score 8), and the patient was discharged on postoperative Day 20, at which time she was able to walk and talk with her family (NIHSS score 5). After discharge, she continued to develop multiple asymptomatic infarctions despite optimal medical management, but no symptomatic infarctions were encountered. She died from respiratory failure on postoperative Day 98.

Comment

Terminally ill cancer patients frequently develop a number of severe complications.[16–21] Management of these complications is challenging because no consensus has been reached on the optimal aggressiveness of treatment.[1–3]

Trousseau syndrome is one of the most common complications for patients with advanced cancers. This potentially life-threatening complication can cause not only physical dysfunction but also serious brain dysfunction such as aphasia and can markedly menace QOL for both patients and their families.

Generally, the treatment of cerebral infarction including Trousseau syndrome has two aspects: improvement of symptoms and secondary prevention. Mechanical thrombectomy can improve symptoms and is effective for the treatment of acute ischemic stroke in patients with occlusion of the first segment of the MCA or the internal carotid artery if treatment is initiated within 6 hours.

Four cases of thrombectomy for Trousseau syndrome have been reported.[6,9,10] More reports are available if tumor embolism is included, but none have described cases involving terminally ill patients.[22–24]

Decision making in terminal care is very delicate and difficult. Some reports have described the decision-making process in the management of terminally ill cancer patients with complications such as hypercalcemia, infection, and dehydration.[1,3,4,25] However, to the best of our knowledge, no papers have examined mechanical thrombectomy for stroke associated with Trousseau syndrome at the end of life. The primary goal of medical care is to restore or maintain the patient's health as much as possible while also minimizing the risk of harm. From an ethical perspective, any treatment that does not provide benefit to the patient should be withheld or withdrawn, and the goal should be shifted to the alleviation of existing symptoms.[26,27] We have to consider many factors, such as the benefits, risks, wishes of the patient and their family, and the expertise available in local practices.

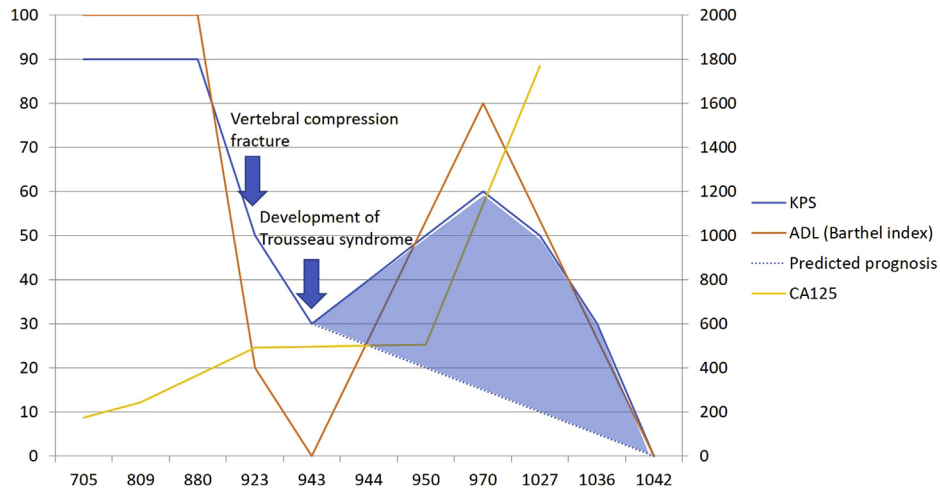

Fig. 4. Clinical course of the patient. This graph shows the temporal course of KPS, ADL, and CA125 (ovarian tumor marker). KPS and ADL deteriorated immediately after the development of Trousseau syndrome but showed marked improvement immediately after mechanical thrombectomy. If the patient had not undergone mechanical thrombectomy, KPS would have continued to deteriorate slowly (blue dotted line). The blue shaded region indicates the magnitudes of benefit in ADL and QOL that were considered to result from thrombectomy. ADL = activities of daily living; KPS = Karnofsky Performance Status; QOL = quality of life.

Several randomized controlled trials have shown the efficacy of mechanical thrombectomy for acute ischemic stroke resulting from LVO.[12–15,28] According to the 2015 American Heart Association/American Stroke Association Stroke Early Management Guidelines, patients ≥18 years old should undergo mechanical thrombectomy with a stent retriever if they show minimal prestroke disability, have a causative occlusion of the internal carotid artery or proximal MCA, have an NIHSS score ≥6, have a reassuring non−contrast-enhanced computed tomography of the head (ASPECTS ≥ 6), and can be treated within 6 hours of the last known time of a normal state.[29] In our case, all the aforementioned conditions were met. From the perspective of stroke management, this patient was a suitable candidate for mechanical thrombectomy. The indications for mechanical thrombectomy are not restricted to a certain thrombus type. When considering the indication of mechanical thrombectomy in patients with Trousseau syndrome, comparing the prognoses of cancer and stroke is important. Thrombectomy is particularly indicated for patients with relatively good prognosis of cancer and poor prognosis of stroke. In this patient with ovarian cancer, estimated survival was a few months based on validated prognostic scores. On the other hand, in terms of the stroke, the high NIHSS score, elevated D-dimer concentration, and modified Rankin Scale score > 3 on previous discharge were all factors independently associated with poor prognosis of stroke.[30–32] In this case, we predicted that stroke prognosis was poor even with the best medical treatment, because NIHSS score was 18, D-dimer was elevated and predicted modified Rankin Scale score at discharge was over 3. Comparing the prognoses of cancer and stroke, thrombectomy was considered potentially effective.

We also considered the risks of treatment. Trousseau syndrome frequently recurs, because of the underlying hypercoagulable status associated with the underlying cancer. In fact, in two of four reported cases, LVO recurred after mechanical thrombectomy.[6,10] Thrombi in Trousseau syndrome mostly comprise fibrin, causing higher frictional resistance than other thrombi such as cardiogenic thrombus or atheroma.[6,33] Thrombectomy can be challenging in the setting of higher frictional resistance and carries risks of events including vessel perforation, dissection, and hemorrhagic events. In our case, we needed three attempts because of the high friction resistance for fibrin, with subsequent achievement of a recanalization Thrombolysis in Cerebral Infarction scale classification of 2b.

In situations where thrombectomy is required, little time is available because this treatment must be provided within a relatively narrow window of opportunity; however, confirming consent from the patient and/or family is considerably important.[1,2,34–36] In addition, it is limited especially in outpatients because duration from onset to treatment can be longer than that in hospitalized patients.

Finally, we should consider whether thrombectomy is consistent with the goals of care for the patient. The goal of care in this case was to improve QOL for the patient, especially to improve her ability to communicate, which was desired by both the patient and her family. Mechanical thrombectomy offered the possibility of achieving this goal.

Based on these assessments, performing mechanical thrombectomy was considered appropriate in this case. In fact, mechanical thrombectomy dramatically improved activities of daily living and long-term QOL over the last months of life. Fig. 4 shows the improvements in functional prognosis and long-term QOL, indicating that thrombectomy benefited the patient.

In conclusion, we performed mechanical thrombectomy to treat a terminally ill cancer patient with LVO associated with Trousseau syndrome. The appropriateness of thrombectomy for terminally ill cancer patients should be determined quickly by an interdisciplinary team based on the benefits, risks, consent from the patient and/or family, and consistency with the patient's goals of care. Mechanical thrombectomy for Trousseau syndrome offers the potential to markedly improve QOL in terminally ill patients.

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Ethical approval: This study was approved by the ethics committee at the Seirei Hamamatsu General Hospital. An institutional review ethics committee determined that informed consent was not required.

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