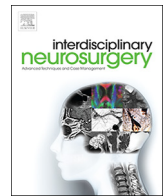




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Letter to the Editor

Safety management in urgent endonasal *trans*-sphenoidal surgery for pituitary adenoma during the COVID-19 pandemic in Japan – A case report



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ABSTRACT

We report a 72-year-old woman who required urgent endonasal *trans*-sphenoidal surgery (eTSS) because of progressive visual field disturbance due to pituitary adenoma, in whom we conducted reverse-transcriptase-polymerase-chain-reaction (RT-PCR) for COVID-19 and chest CT before eTSS. We took care of her by following the rule for suspected infection patient, and safely completed her treatment without medical staff infection. Under COVID-19 pandemic state, essentially careful management including RT-PCR test and chest CT should be taken for the high infection risk surgeries to avoid the outbreak through the hospital. And the cost of RT-PCR test for the patients should be covered by the government budget.

1. Introduction

As of June 28, 2020, Japan has had 18,584 cumulative confirmed COVID-19 cases and 972 deaths (mortality rate 5.2%). The number of newly confirmed patients are declining, and Japanese government released the State of Emergency on May 25. But the infection has not been controlled yet. Recently, Keio University Hospital, Tokyo, Japan tested for COVID-19 infection by reverse-transcriptase-polymerase-chain-reaction (RT-PCR) for patients who are admitted to or undergo operation in their hospital in order to avoid the outbreak of COVID-19 at the hospital. Surprisingly, about 7.46% of them were judged positive for COVID-19 without any related symptoms between April 13 to 19 [1]. It strongly suggests that community transmission in Japan may be already higher than expected. The first outbreak of COVID-19 among medical staffs occurred after endonasal pituitary surgery at Union Hospital, Wuhan, China [2]. In certain neurosurgical procedures through upper respiratory tracts such as endoscopic endonasal surgery and skull base surgery, there is a high risk of viral aerosolization with subsequent infection of surgeons and operating room staff [3,4]. Herein, we report a patient who required relatively urgent eTSS under pandemic state in Japan, and mention the necessity of both RT-PCR test and chest CT before eTSS.

2. Case report

A 72-year-old woman with uncorrectable poor visual acuity and bilateral hemianopsia was referred to our hospital on March 17, 2020. Magnetic resonance images showed pituitary tumor compressing optic nerves upwards (Fig. 1). Her serum prolactin elevated as 164.1 ng/ml (normal range: 4.3–13.7 ng/ml). Then, eTSS was scheduled on April 10 as usual, because no COVID-19 infection had been reported in Toyama Prefecture at that time. Toyama Prefecture is located at the center of main island of Japan and the population is around one million. On March 25, however, the Japan Neurosurgical Society announced the COVID-19 transmission risk at eTSS. On March 30, the first patient with COVID-19 infection was found in Toyama Prefecture. On April 1, therefore, we examined the patient's visual acuity and visual

field once more to seek the possibility to postpone her operation. But repeated examination revealed the worsening of her visual field. Most pituitary tumors are not life threatening, but too late operation may result in irreversible visual disturbance. So, we decided to perform eTSS for her as scheduled. On April 2, we very precisely reviewed a list of her symptoms and exposure history for these two weeks, and also performed RT-PCR for COVID-19 by obtaining her informed consent in order to assess the possibility of COVID-19 transmission during eTSS. As the result, the RT-PCR was judged as negative. During that period, the number of COVID-19 infected patient was dramatically increased, and the Japanese government declared the State of Emergency on April 7. We further performed lung CT, even though she had no sign of pneumonia and infection. Subsequently, we decided to perform eTSS as scheduled under special cautions (Fig. 2). The operation was performed in the negative pressure room and we restricted the access into the operating room. The staffs entering the room were required to wear personal protective gown over scrub, face shield and EN FFP-2N-95 mask. The surgeons put on double gloves. The operation was completed uneventfully. Histological diagnosis of the tumor was pituitary adenoma. Her visual condition recovered just after surgery, and she was discharged 14 days after surgery. No medical staffs who joined the operation had been suffered from COVID-19 after surgery.

3. Discussion

We could safely complete eTSS for a patient with aggravating visual symptom due to pituitary adenoma. In this patient, we conducted RT-PCR examination for COVID-19 just before admission. The result was negative, but we were very carefully to take care of her by following the rule for suspected infection patient preoperatively in the operating room. Under COVID-19 pandemic state, incredibly careful management including RT-PCR test should be taken for patients who carry high risk for surgeries such as eTSS to avoid the outbreak through the hospital.

Chest CT should be also performed to deny the infection, because the false negative ratio of RT-PCR might be as high as 21.4% [5]. Several studies support the importance of chest CT to identify COVID-19 infected patients in addition to RT-PCR [6,7]. A recent study showed

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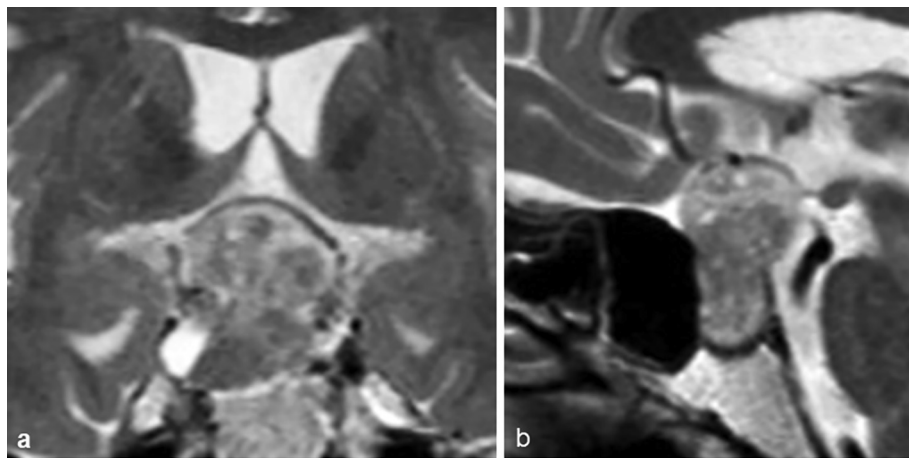


Fig. 1. T2-weighted MR image, coronal (a) and sagittal (b), demonstrated mixed intensity mass, compressing optic nerves upwards, in the sella and supra-sella portion.

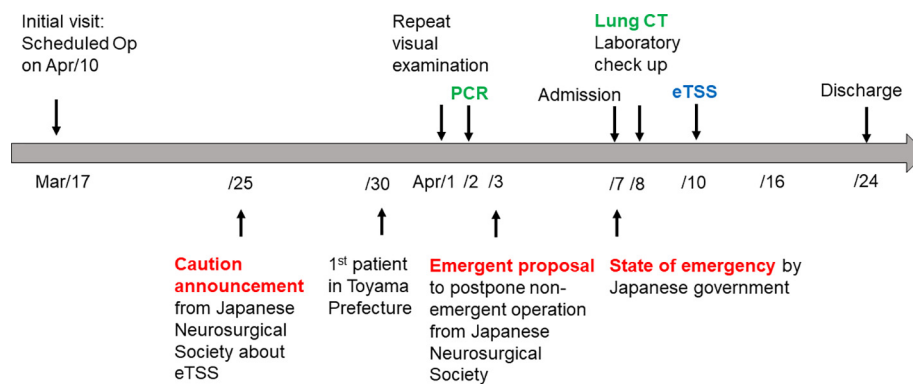


Fig. 2. Management course eTSS: endoscopic endonasal *trans*-sphenoidal surgery PCR: polymerase chain reaction.

that in 601 patients with a positive RT-PCR the sensitivity of chest CT was 97% [6]. The incubation period of the RT-PCR is 5 days (4.5–5.8) and the majority of infected patients only develop symptoms within 11.5 days (CI, 8.2 to 15.6 days) [8]. So the RT-PCR test should be performed a few days before admission to avoid the outbreak in the hospital.

The nationwide survey in Japan about head and neck cancer surgery in April 2020 demonstrated that chest CT scan was fully performed (90%), but the RT-PCR testing was not adequately performed (51%) [9]. Even in Japan with universal insurance, however, the expenditure of COVID-19 RT-PCR test for asymptomatic patients had not been covered by insurance. Our university hospital had to pay for the cost at that time. To avoid the outbreak in the hospital through operations, the COVID-19 RT-PCR test for patients who are going to have high infection risk surgery should be covered by government budget. The society may face the second wave of COVID-19 pandemic. We believe not only RT-PCR but also chest CT should be performed before the high risk surgery for infection under pandemic and even after pandemic state.

Headings

eTSS during the COVID-19 pandemic

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to

influence the work reported in this paper.

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