

# Perioperative challenges in managing a patient with COVID-19 undergoing debridement for massive scalp myiasis

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## SUMMARY

A young man presented to our centre needing an urgent debridement of his postcraniotomy wound due to massive myiasis during the COVID-19 pandemic in October 2020. Prior to the surgery, his nasopharyngeal swab real-time PCR test result was unknown. One day later, it returned as SARS-CoV-2 positive. All healthcare workers who were involved in the patient management avoided cross infection as they wore appropriate personal protective equipment. This article depicts the importance of adequate preparations when handling potentially infectious patients and the perioperative issues associated with it.

## BACKGROUND

COVID-19 surfaced in mid-December 2019 and was declared a global pandemic in March 2020 by WHO. To curb the spread of this deadly virus, governments imposed strict standard operating procedures and health guidelines to protect the public, especially the healthcare worker (HCW).

We share our perioperative experience of handling a patient with massive myiasis of his postcraniotomy wound during the COVID-19 pandemic in Sabah, Malaysia. Prior to the emergency surgery, his nasopharyngeal swab real-time PCR (RT-PCR) was unknown. This prompted the HCW to take optimum preparations to prevent from being infected, perioperatively. His RT-PCR result returned as positive SARS-CoV-2 the next day and was isolated. He recuperated well and was discharged to home after 9 days. All HCWs were fortunate as none of them were infected as they donned personal protective equipment (PPE) perioperatively.

## CASE PRESENTATION

A 20-year-old man presented with maggot infestation of his postcraniotomy wound over the left side of his head for 2 days of duration. Two weeks ago, he had a motor vehicle accident and developed a severe left temporoparietal extradural haemorrhage. He underwent an emergency craniotomy and was discharged home a week later. He was semidependent with a full Glasgow Coma Scale E4V5M6. The patient's father cared for his daily well-being and also postcraniotomy wound once every 2–3 days. He claimed that they had good basic sanitary access, such as clean water and optimal nutrition. During the first hospitalisation, he was

asymptomatic of COVID-19 and nasopharyngeal swab RT-PCR was negative throughout.

After 1 week, his father noticed maggots crawling out of the wound associated with foul-smelling discharge. He had a low-grade fever but there was no cough, sore throat or runny nose. They denied any close contact with people diagnosed or suspected of COVID-19 for the past 2 weeks. On assessment, there was an open wound measuring 2×2 cm in size with presence of maggots and pus ([figure 1](#)). His vital signs were stable with a low-grade fever of 37.5°C. The provisional diagnosis was post craniotomy surgical site infection complicated with massive cutaneous myiasis. He was urgently pushed for an emergency wound debridement and refashioning.

## INVESTIGATIONS

- ▶ All his haematological parameters were normal except for the elevated total white cell count at  $28.5 \times 10^9/L$ .
- ▶ CT brain showing pneumocranium over left frontoparietal extradural space with extradural collection ([figure 2](#)).

## TREATMENT

Due to the ongoing COVID-19 pandemic and in accordance to our hospital guidelines, the patient's nasopharyngeal swab was taken for RT-PCR. However, the test result was delayed and not delivered on time due to severe backlog in our centre. As this surgery was urgent, we decided to treat our patient as a potential COVID-19 positive, with optimum precautions taken by all HCW.

The patient, operating theatre (OT) and HCW were prepared in accordance with the guidelines set by the Malaysian Ministry of Health and the American Society of Anesthesiologist, respectively. We ensured a safe and clean passage for the patient's transfer and effective communication among HCW throughout the process. Both the neurosurgical and anaesthetic teams donned mandatory PPE, which included the white overall suit.

Adequate intravenous access was obtained prior to commencement of surgery. The patient was gently intubated by using C-MAC video laryngoscope via modified rapid sequence intubation (RSI). Wound debridement was done and infected tissues with maggots were carefully removed. The tissues were very fragile and brittle, causing haemorrhage of up to 1.5 L. Two pints of Safe 'O' packed cells was transfused intraoperatively as he demonstrated



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**Figure 1** Maggots were seen crawling out from the postcraniotomy wound.

hypotension and tachycardia. Anaesthesia was reversed using intravenous sugammadex 2 mg/kg and extubated well. He was sent back to the ward for observation and wound management.

#### OUTCOME AND FOLLOW-UP

His RT-PCR result returned as positive SARS-CoV-2 the next day. He recuperated well and was discharged home after 9 days. The involved HCWs avoided cross-infection as they undertook precautions, including an appropriate use of PPE perioperatively.



**Figure 2** CT brain showing pneumocranium over left frontoparietal extradural space with extradural collection and air filling defects at the cutaneous region (arrow).

#### DISCUSSION

Cutaneous myiasis is exceedingly rare among neurosurgical patients.<sup>1–3</sup> Navarro and Alves described the only documented case of postcraniotomy myiasis in the Brazil in 2016 but no similar literature has been reported in other developing countries.<sup>4</sup> Wound healing causes itchiness. Patients will tend to scratch their wounds, and this subsequently leads to gaping. Open wounds and necrotic tissues often release ammoniacal smell that attracts necrophagous flies, commonly *Chrysomya bezziana* and *Chrysomya megacephala*, which will deposit eggs.<sup>5,6</sup> They will hatch into larvae that burrow into deeper tissues to feed on them. This will cause tissue necrosis, oedema and disseminated sepsis.

The deadly COVID-19 emerged in mid-December 2019 and caused massive havoc. Huge amounts of time, money and effort were spent to tackle COVID-19 globally. Malaysia has also not been spared by this raging virus and recorded 600–1200 daily number cases at its peak. Nonetheless, the Ministry of Health Malaysia moved to impose strict guidelines to break the chain of infection and ensure HCW safety.<sup>7,8</sup>

There are a few interesting points about the case that are worth discussing. The patient developed cutaneous myiasis in his post-craniotomy wound, complicated by sepsis. COVID-19 can present as sepsis hence precautionary isolation measures were taken against him, as RT-PCR test results were unavailable.<sup>9</sup>

Many challenges around perioperative management arose but were overcome in this patient. First, a major concern among the team of HCW was that the batteries powering the powered air-purifying respirators might go completely drained, causing safety hazards and anxiety. Second, the patient was extremely anxious about the maggots at his forehead, which exacerbated itchiness and led to difficulty positioning him supine. The awkward position that he assumed resulted in suboptimal preoxygenation efforts before tracheal intubation due to the fear of seeing maggots crawling out of his wound. Third, only two skilled anaesthesiologists in the OT was allowed hence the neurosurgeon was required to assist with modified RSI by applying cricoid pressure. Nevertheless, chest auscultation after tracheal intubation was omitted to minimise exposure to aerosolised viruses.

Fourth, the use of PPE impacted on non-technical skills and performance. For example, verbal communication was impeded, forcing staff to speak louder and causing additional discomfort in a surgery. Additionally, impaired visibility, due to the use of respirators and goggles, partially obstructed their view of the surgical field. Besides that, limited dexterity caused by the double and even triple gloving hampered surgical skills as well as vein assessment and cannulation, prolonging the operation unnecessarily.

Fifth, plastic coverings put over the general anaesthetic machine posed problems operating the machine, potentially a major issue in patients with difficult ventilation. Water resistant sheets draped over the patient and operation table made quantifying blood loss challenging. Blood transfusion was commenced soon after signs of hypovolemic shock appeared. Lastly, intravenous sugammadex was used to reverse muscle relaxation to achieve smooth extubation without coughing, increasing healthcare budget, especially in low/middle-income countries.

It is prudent to always uphold safety of all HCW when attending to patients who are suspected of infectious diseases. By doing this, vast psychological, economic and healthcare crisis can be averted. HCW should be comfortable and apt with donning PPE in whatever procedures they do.

## Patient's perspective

I am thankful to God that none of the hospital frontliners were infected with COVID-19. I do not know how can I be infected with COVID-19 as to my best understanding, myself and family never go out from home unnecessarily. I feel better now after the wound debridement and glad that I have recovered from both maggot infestation and COVID-19 now.

## Learning points

- ▶ Massive cutaneous myiasis is an emergency.
- ▶ During a global pandemic, all efforts should be done to ensure safety of healthcare worker (HCW) and patients.
- ▶ Surgery can be safely conducted on patients who are suspected of COVID-19, irrespective of their real time PCR results, provided all HCW are adequately donned with PPE, to prevent themselves from cross infection.
- ▶ All HCW should be adequately trained and skilled in handling COVID-19 patients, which can be in the form of simulation, video recording and direct observation.

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## REFERENCES

- 1 Teah MK, Chu YM, Shanmuganathan SD, *et al.* Massive airway myiasis: an extreme rarity. *BMJ Case Rep* 2020;13:e237764.
- 2 Cheshier SH, Bababeygy SR, Higgins D, *et al.* Cerebral myiasis associated with angiosarcoma of the scalp: case report. *Neurosurgery* 2007;61:E167.
- 3 Terterov S, Taghva A, MacDougall M, *et al.* Posttraumatic human cerebral myiasis. *World Neurosurg* 2010;73:557–9.
- 4 Navarro JN, Alves RV. Postoperative cerebral myiasis: a rare cause of wound dehiscence in developing countries. *Surg Neurol Int* 2016;7:69.
- 5 Lee HL, Yong YK. Human aural myiasis. *Southeast Asian J Trop Med Public Health* 1991;22:274–5.
- 6 Srinivasan R, Pani SP. Myiasis in human filarial lymphedema. *Southeast Asian J Trop Med Public Health* 1992;23:807–8.
- 7 COVID-19 Malaysia. COVID-19 Malaysia Updates [online], 2020. Available: <http://covid-19.moh.gov.my/>
- 8 Asahq.org. Coronavirus (2019-Ncov) COVID-19 [online], 2020. Available: <https://www.asahq.org/about-asa/governance-and-committees/asa-committees/committee-on-occupational-health/coronavirus>
- 9 Beltrán-García J, Osca-Verdegal R, Pallardó FV, *et al.* Sepsis and coronavirus disease 2019: common features and anti-inflammatory therapeutic approaches. *Crit Care Med* 2020;48:1841–4.

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