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Trigemino-cardiac reflex-related sudden bradycardia and hypotension can be induced by drain removal after superficial parotidectomy

KEYWORDS

Trigemino-cardiac reflex (TCR);
Trigeminal nerve;
Temporoauricular nerve;
Parotidectomy;
Drain removal

Trigemino-cardiac reflex (TCR) is a brainstem reflex triggered by the stimulation of the trigeminal nerve with efferent signals passing through the vagus nerve to the heart. Symptoms include sudden development of bradycardia, arterial hypotension, apnea, and gastric hypomotility. The occurrence may be easily diagnosed with drops of more than 20% to the baseline heart rate and mean arterial pressure. Although rare in occurrence rate, multiple oral and maxillofacial surgeries encountered the reflex have been reported in the literature.^{1–3} Even non-surgical dental endodontic treatments may trigger the reflex.^{4,5}

Here, we presented a 52-year-old male patient with type 2 diabetes and a Warthin's tumor of the left parotid gland. He received surgery of superficial parotidectomy with facelift incision under facial nerve monitoring system. A JacksonPratt drainage tube was applied over the surgical field and exited from the retroauricular area, providing negative-pressure suction for postoperative care. Minimal drainage was attained on postoperative day 4. At the moment of drain removal, the patient showed transient drowsy consciousness and postural instability. Then, he complained about vertigo. Vital signs showed heart rate of 42 beats per minute and blood pressure of 90/74 mmHg in

comparison to his baseline heart rate of 72 beats per minute and blood pressure of 120/83 mmHg (Fig. 1). Pulse oximeter showed full oxygen saturation. Electrocardiogram recorded sinus bradycardia. The patient's heart rate and blood pressure returned to the baseline level within minutes. Besides, the monitor were applied while waiting for laboratory results of cardiac enzyme tests to rule out sudden onset of cardiogenic disorder. Later on, cardiac enzyme tests showed levels within normal ranges. The patient was discharged under stable hemodynamic status and wound conditions afterward and underwent an uneventful recovery. The transient dropdowns of heart rate and blood pressure upon drain removal led to the diagnosis of the TCR.

For preventing future events, it is worth emphasizing on prevention measures especially in the perioperative period. With the understanding of trigeminal nerve anatomy, we shall avoid direct contact of drainage tube and trigeminal nerve distribution area. The temporoauricular nerve supplies the parotid gland along the course of superficial temporal vessels. Its nerve endings may be exposed in the field of parotid gland after soft tissue dissection. Therefore, a layer of barrier may be designed by closure of the

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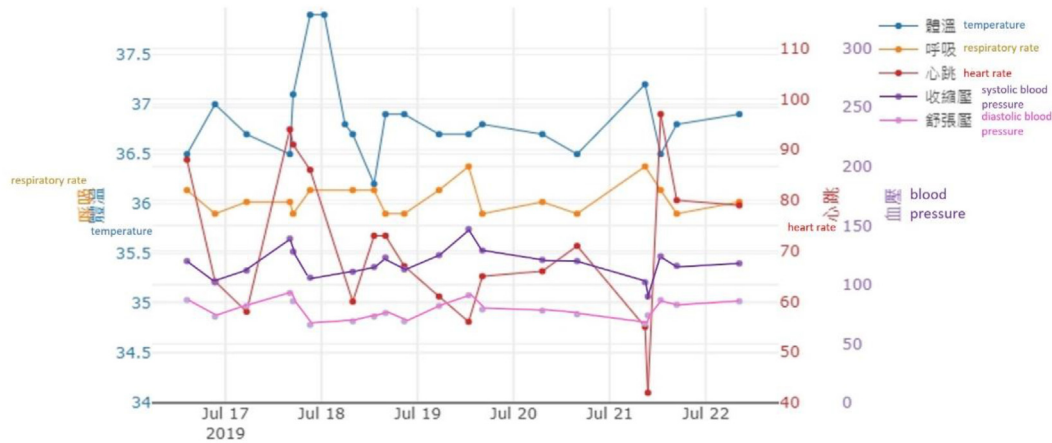


Figure 1 Vital signs chart of the patient. The red-dot line represents heart rate. The dark purple-dot line represents systolic blood pressure and light-purple dot line represents diastolic blood pressure. We can see the obvious change of red-dot line and purple-dot lines on July 21, 2019. Moreover, the vital signs returned to normal range within minutes.

parotid capsule or by superficial musculoaponeurotic system layer prior to the placement of the drainage tube. On the other hand, the literature showed TCR may be encountered during facial nerve monitoring assisted parotidectomy in which light-plane of general anesthesia was adopted.³ Repeated episodes of bradycardia in response to mechanical dissection close to the trigeminal nerve innervation area were found. This provides us a clue when placing the drainage tube and helps us to see whether any sliding motion may cause corresponding bradycardia and hypotension.

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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