Ain-Shams Journal of Anesthesiology

CASE REPORT

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Perioperative patient positioning following scalp tumor surgery: an anesthetic challenge

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Abstract

Background: Spindle cell tumors of the scalp are notorious for their potential to present with torrential life-threatening bleeds during surgery and in the postoperative period. We present the successful management of one such case.

Case presentation: A 54-year-old male was operated on for a huge spindle cell tumor of the scalp located in the occipital area. During surgery, blood loss of 2 l was replaced with crystalloids, colloids, and packed red cells. However, during the change of position from prone to supine immediately after surgery, the patient developed sudden and torrential bleeding from the surgical site, leading to asystole and cardiac arrest. The patient was revived and put on postoperative ventilatory support for 1 day in the intensive care unit. He could be discharged successfully without sequelae.

Conclusions: Positioning after surgery of a vascular tumor of the scalp should be gentle, slow, and monitored. Sudden movements predispose patients to secondary hemorrhage, which in scalp tumors could be torrential and life-threatening.

Keywords: Scalp, Spindle cell tumor, Scalp hematoma, Patient positioning

Background

A spindle cell tumor is a slow-growing benign lipomatous tumor usually seen in men between the ages of 45 and 65 years (Chan 1997). These lesions can be found in a wide range of anatomical locations, including the head and neck, scalp soft tissues, orbit, and upper aerodigestive tract mucosa (Lewis Jr 2008). Spindle cell tumors of the scalp are notorious for their ability to cause torrential life-threatening bleeds during and after surgery. We present successful management of one such case where torrential bleeding started simply because of repositioning of a patient after surgery from a prone to a supine position.

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Case presentation

A 54-year-old ASA-1 male weighing 76 kg presented with a huge swelling in the occipital region of his scalp, growing rapidly in the last one and a half years (Fig. 1). He was operated upon twice, apparently for the same tumor, 7 years ago. Fine needle aspiration cytology of the progressively increasing occipital tumor revealed clusters of oval and spindle-shaped cells. A CT scan of the head revealed heterogeneously enhanced soft tissue density of the scalp lesion ($10 \times 6 \times 10$cm) in the right parieto-occipital region, with no obvious vascular invasions or intracranial extensions (Fig. 2). He was planned for wide excision of the tumor with a flap cover. In preoperative airway evaluation, the patient was found to be Mallampati grade 2 with limited neck extension movement. His hemoglobin was 12.9 gm/dl, and all other laboratory parameters were within normal limits. Informed written consent was obtained from him for the surgery and also for the reporting of the case in the medical literature.

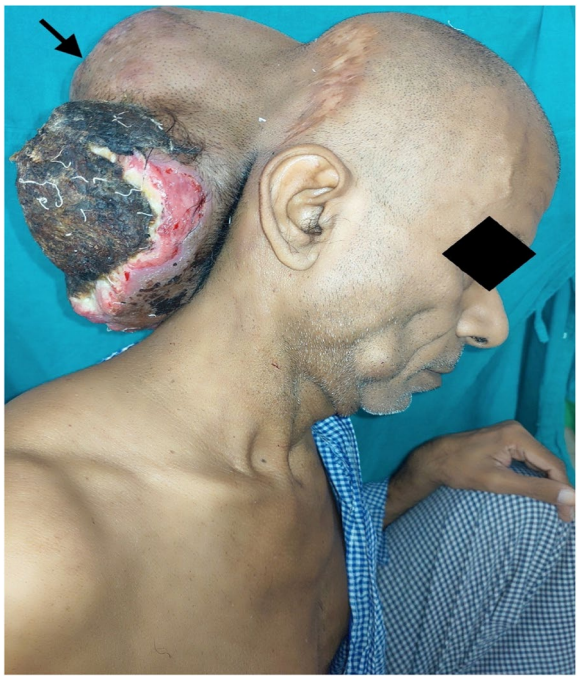

Fig. 1 Huge scalp swelling in the occipital region

Standard monitors were attached to the operating room, and an 18G intravenous line was placed in the right forearm. He was induced with intravenous midazolam 2 mg, fentanyl 150 µg, propofol 120 mg, and succinylcholine 100 mg. Care of the huge occipital mass was taken, keeping it inside a ring made of cotton. After ensuring proper head, neck, and shoulder positioning, the trachea was intubated without much difficulty. The central venous line, arterial lines, and another 16G intravenous cannula in the left forearm were then secured, and the patient was positioned in the prone position for surgery. Intraoperatively, the tumor was found to invade the bone with infiltration into the dural venous sinuses, which was not seen at the time of the CT scan. As soon as the venous sinus was breached, blood started flowing profusely. Hemostasis was achieved by the use of bone wax. A large scalp flap was transposed into the defect, and secondary raw areas were covered with a split-thickness skin graft taken from the thigh. There was a loss of about 2 l of blood during surgery that lasted 4 h. About 4 l of crystalloids, 500 ml of hydroxyl ethyl starch, and three units of packed red cells (750 ml) were given intra-operatively during which the patient remained hemodynamically stable. The surgery was done in the prone position, and our problems started just when the patient was put back in the supine position after the completion of the dressing. We noted that the drain was filling up rapidly with fresh blood, and oozing was also noted on the dressings at the incision site. The rapid rate at which the drain filled up was alarming. A decision to immediately re-examine the wound was taken. Dressings and sutures were removed, and the surgical site was explored in the supine position itself. A liter equivalent of blood clots was discovered. On exploration, the dural sinus hemostasis was found disrupted, and this was again sealed with bone wax, and a pressure bandage was applied. The heart rate was 160 beats per minute, and the blood pressure had become unrecordable. Rapid intravenous fluids were given and an injection noradrenaline infusion was started to ensure perfusion; however, the patient started having bradycardia and developed asystole, probably due to a combination of hypotension, hypoperfusion, hypovolemia, and hypothermia. The patient received two cycles of cardiopulmonary resuscitation. Inj. adrenaline 1 mg was given before the return of spontaneous circulation could be noted. Three units of packed red cells, four units of fresh frozen plasma, and 1 l of crystalloid were transfused over an hour. There-exploration and hemostasis needed 1 h for completion. Blood gas analysis was done after CPR showed PH-7.15, PCO2-28, Po2-260, Hco3-14, Lactate-6, and Hb-7. The patient was shifted to the intensive care unit (ICU) on a mechanical ventilator with noradrenaline infusion running at 0.1µg/kg/min, which was gradually tapered and then stopped after 6 h. After 4 h of shifting into the ICU, the blood lactate value had come to 2.6, and the pH had stabilized to normal. His heart rate was still 150 beats per minute, and his arterial blood pressure was 90/60 mm Hg. In the ICU, he received 4 units of platelets and a balanced salt solution as intravenous fluid. Postoperative analgesia was maintained by intravenous fentanyl infusion at 40 µg/h and injection of paracetamol 1 gm every 8 h. He was on ventilator support for the next 16 h until his trachea was extubated. He was discharged from the intensive care unit on the third postoperative day.

Discussion

Spindle cell tumors in the scalp have been described to pose a significant threat to primary and reactionary bleeding. Postoperative hemorrhage may be classified as primary bleeding if it occurs within the intraoperative period. Reactionary or reactive bleeding occurs within 24 h of operation (Erian et al. 2008). Secondary bleeding occurs 1 week to 10 days post-operatively, often due to erosion of a vessel due to any cause. The importance of careful post-procedure handling of patients is often underrated. This report highlights the importance of gentle and careful patient positioning postoperatively to prevent reactionary hemorrhage. It also shows frailty in patients who have just undergone long surgeries, exhausting their reserves to tolerate major insults such as postoperative bleeding. In this

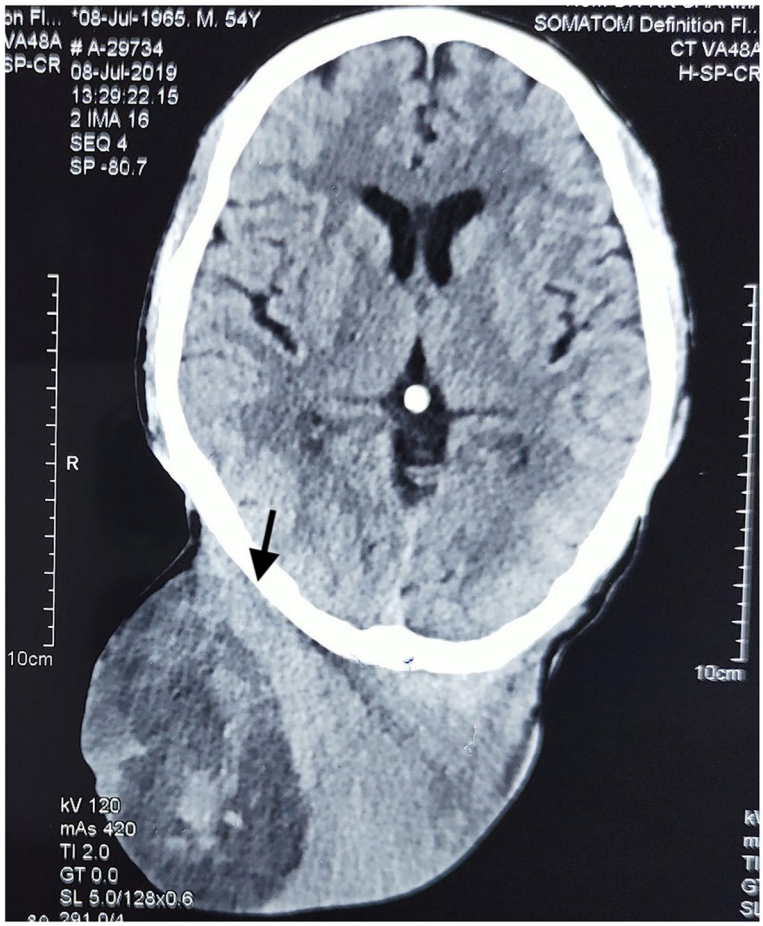

Fig. 2 CT scan of the head showing enhaced soft tissue density scalp lesion in the right parieto-occipital region

case, a severe reactionary hemorrhage during position change resulted in a cardiac pulmonary arrest. There have been reports of successful management of similar cases. A case of a large spindle cell tumor present in the occipital region, almost as large as the head itself, has been described in an adult patient. However, our case is unique as not many reports have described post-operative bleed resulting in an arrest simply after a position change (Naaz et al. 2021). The CT scan may not always be able to predict intraoperative bleeding risks unless angiography is done to ascertain vascular invasion. Magnetic resonance imaging (MRI) has been suggested in such cases to determine the relationship of a scalp tumor with the brain, cranial nerves, and dural sinuses. MRI is considered an imaging technique of choice for a soft tissue mass, because of its ability to discriminate fat from muscle and to demarcate muscle groups, and neurovascular structure. Angiography, however, is a preferred investigation with the added advantage of the ability to embolize feeder vessels, which then ensures minimal blood loss. Preoperative imaging may help in the planning and management of such tumors, especially when there is evidence of vascular invasion. Even with good preoperative preparation, however, the impact of gentle and careful postoperative handling cannot be overemphasized. Not much literature is available highlighting this aspect of anesthesia care, though there have been reports of pulmonary embolism also, following position changes in patients postoperatively (Hong et al. 2019). Bhaskar S. et al. have reported a case of atraumatic massive scalp hematoma after a case of neurofibroma for which the patient was managed with massive blood transfusions, control of bleeding by exploration, and supportive care (Bhaskar et al. 2013). The sudden bleeding in this case, especially after a change in patient position, could be because of disruption and dislodgement of the bone wax, resulting in the opening up of venous sinuses. It could have been due to the opening up of ligatures, which were securing the blood vessels. An unlikely reason for reactionary hemorrhage could also be due to an increase in blood pressure secondary to stimulation of the patient during

position changes. Patient position changes should thus be made with caution and slowly (Cassorla and Lee 2015).

Conclusions

It is prudent to keep in mind that sudden blood loss in patients with scalp tumors even during post-operative position changes could have catastrophic consequences, especially after prolonged surgeries with large intraoperative losses because their reserves for compensation have already been harnessed. A preoperative discussion among the multidisciplinary team about the plan of surgery should be done to avoid major intraoperative blood loss for the reconstruction of such a huge scalp tumor. Preoperatively, the cross-matched blood and blood product should be immediately available and the postoperative care in intensive care unit by multidisciplinary team should be continued in these types of cases.

Abbreviations

ASA: American Society of Anesthesiology; ICU: Intensive care unit; CT scan: Computed tomography scan; MRI: Magnetic resonance imaging; CPR: Cardio pulmonary resuscitation.

Acknowledgements

Not applicable.

Authors' contributions

RK: Manuscript preparation, concepts. NS: Manuscript review. SN: Manuscript editing. RK: Literature search. AH: Manuscript editing. The authors have read and approved the manuscript in this case.

Funding

Nil.

Availability of data and materials

Not applicable.

Declarations

Ethics approval and consent to participate

Ethical approval is not required for the publication of these case reports. The patient was informed about the procedure, and a written informed consent was obtained.

Consent for publication

Written permission/consent of the patient for the purpose of publication in an educational medical journal was obtained from the patient.

Competing interests

The authors declare that they have competing interests.

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Received: 18 June 2021 Accepted: 23 September 2022
Published online: 10 October 2022

References

Bhaskar S, Sobti S, Singh AK (2013) Massive scalp hematoma due to diffuse neurofibroma in NF-1. Clin Neurol Neurosurg 115:477–480
Cassorla L, Lee JW (2015) Patient positioning and associated risks. Miller's Anesthesia 41:1240–1265
Chan JK (1997) Solitary fibrous tumour: everywhere, and a diagnosis in vogue. Histopathology 31:568–576
Erian M, Mc Laren G, Khalil A (2008) Reactionary hemorrhage in gynecological surgery. JSLS. 12(1):81–84
Hong B, Yoon SH, Park SY, Song S, Youn A, Hwang JG (2019) Cardiac arrest from patient position change after spine surgery on a Jackson table. Acute Crit Care 34(1):86–91
Lewis JS Jr (2008) Spindle cell lesions—neoplastic or non-neoplastic? Spindle cell carcinoma and other atypical spindle cell lesion of the head and neck. Head Neck Pathol 2:103–110
Naaz S, Sahay N, Kumar R et al (2021) A giant scalp tumor on the occiput: a challenge in positioning and airway management. Ain-Shams J Anesthesiol 13:46. https://doi.org/10.1186/s42077-021-00164-4

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