

# Polycythemia caused by erythropoietin-producing hemangiosarcoma

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## KEYWORDS

erythropoietin, hemangiosarcoma, polycythemia

A 58-year-old male patient with triple-negative polycythemia, with red blood cell (RBC) of  $680 \times 10^4/\mu\text{L}$ , hemoglobin of 21.0 g/dL, and hematocrit of 62.0%, was treated in our institution. His first symptoms were headache and a reddish face. Initially, he was treated by phlebotomy at 400 mL, from weekly to monthly. His polycythemia and symptoms completely recovered to normal RBC condition after 10 phlebotomies (400 mL in one phlebotomy). However, he returned to our hospital after 6 months with refractory vertigo. Cranial magnetic resonance imaging revealed an enhanced 4-cm tumor in the right lobe of the cerebellum (Figure 1A). Serum erythropoietin was 51.1 mIU/mL (4.2–23.7). Complete neurosurgical resection was performed, revealing pathological findings of hemangiosarcoma (Figure 1B). Serum erythropoietin levels decreased to the normal range postoperatively. Secondary polycythemia should be differentiated initially, although polycythemia caused by erythropoietin-producing tumors is substantially less frequent.

## AUTHOR CONTRIBUTIONS

Osamu Imataki and Makiko Uemura managed the patient's case, contributed to the literature search, and wrote the manuscript. Makiko Uemura made substantial contributions to the concept and design of this report. Osamu Imataki and Makiko Uemura qualified the patient's data and suggested important intellectual content. Makiko Uemura took part in critical discussions. Makiko

Uemura was involved in the supervision of the manuscript and managed the research. Both authors approved the final version of the manuscript.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

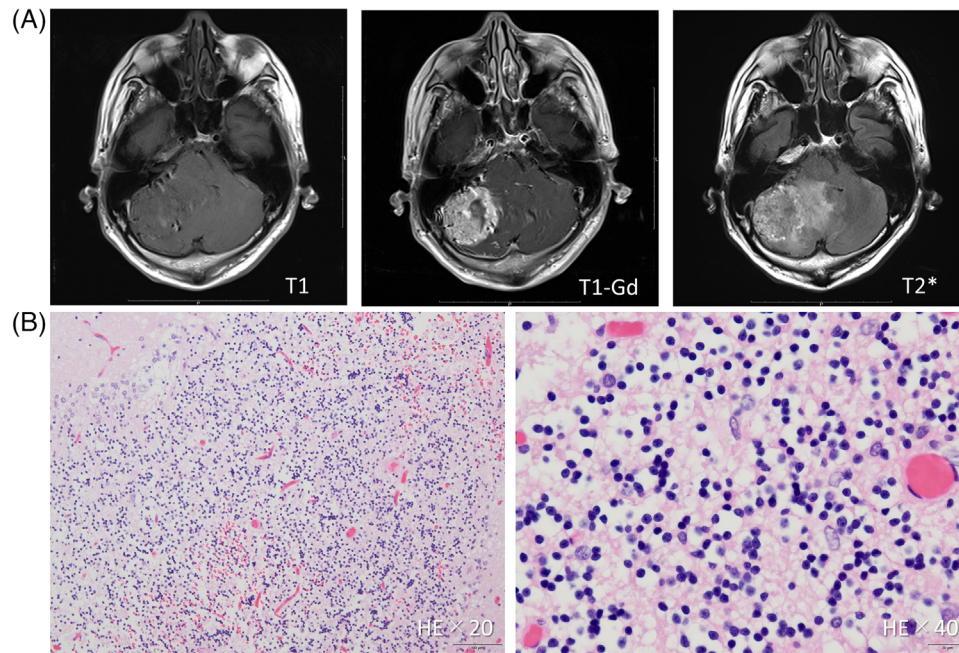
All data generated or analyzed during this study are included in this published article. Data are available on request due to privacy/ethical restrictions.

## ETHICS STATEMENT

We obtained approval from the Kagawa University Hospital Institutional Review Board (H23-023). This research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. The subjects have given their written informed consent to publish their case (including the publication of images).

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**FIGURE 1** (A) The patient's cranial magnetic resonance imaging showed an enhanced 4-cm tumor (T1 iso- and T2 high-signal) in the right lobe of the cerebellum. (B) The patient's neoplasm presented clear, foamy cells formation growing in nest or sheet morphology with abundant large and small blood vessels. It was accompanied by tissue necrosis and hemosiderin deposition.

#### PATIENT CONSENT STATEMENT

Written informed consent was obtained from the patients for publication of this study.

#### CLINICAL TRIAL REGISTRATION

The authors have confirmed clinical trial registration is not needed for this submission.

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