Heliyon 10 (2024) e28802

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Case report

Coexistence of kaposiform hemangioendothelioma and capillary malformation: More than a coincidence? Two case reports

Xue Gong [a,1], Jiangyuan Zhou [a,1], Siyuan Chen [b], Yi Ji [a,*]

[a] Division of Oncology, Department of Pediatric Surgery, West China Hospital of Sichuan University, Chengdu, Sichuan, China
[b] Pediatric Intensive Care Unit, Department of Critical Care Medicine, West China Hospital of Sichuan University, Chengdu, Sichuan, China

ARTICLE INFO

Keywords:
Case report
Capillary malformation
Kaposiform hemangioendothelioma
Rare diseases
Vascular diseases

ABSTRACT

The coexistence of kaposiform hemangioendothelioma (KHE) and capillary malformation (CM) is quite rare, and few relevant studies can be found to confirm whether this phenomenon is accidental. We diagnosed and treated two such patients, revealing interesting phenomena associated with the development of vascular diseases.

These cases offer the possibility that the coexistence of KHE and CM is not accidental and open up a new field of research related to pediatric vascular tumors and vascular malformations. Personalization and precision are required in the diagnosis and treatment of such patients, and the present findings provide a reliable theoretical and practical basis for further research on the pathogenesis and therapy of patients with multiple vascular diseases.

1. Introduction

Vascular diseases refer to a spectrum of vascular disorders that affect aesthetics and function [1], and the incidence of these diseases varies greatly. The incidence of infantile hemangioma is 4%–5%, while the incidence of kaposiform hemangioendothelioma (KHE) is 0.071 per 100,000 children [2–4]. In 1997, vascular anomalies were stratified into vascular malformations and vascular tumors [5]. As the understanding of vascular anomalies has gradually increased, additional vascular tumors and vascular malformations have been diagnosed and researched [6,7]. Clinically, the coexistence of KHE and capillary malformation (CM) is rare, and the incidence rate is lower than one in a million individuals. Therefore, the aim of the present study was to share the clinical experience and molecular basis of the pathogenesis of these patients, to aid in the exploration of targeted therapy.

2. Case presentation

2.1. Patient 1

A 1-year-old male, an only child, was referred to our center for further evaluation of his condition. Immediately at birth, he had well-demarcated and pink to red patches scattered all over his body, mainly distributed from the middle of the forehead to the tip of the

* Corresponding author. Division of Oncology, Department of Pediatric Surgery, West China Hospital of Sichuan University, 37# Guo-Xue-Xiang, Chengdu, 610041, China.
E-mail address: jijiyuanyuan@163.com (Y. Ji).
[1] These authors contributed equally as co-first authors.

https://doi.org/10.1016/j.heliyon.2024.e28802
Received 12 April 2023; Received in revised form 25 March 2024; Accepted 25 March 2024
Available online 29 March 2024

nose, from the left chest wall to the left costal margin, and from the left back to the bilateral lower limbs. In addition, he had a round lump on his right knee with a red–purple color and surrounding pallor. The mass on the right knee was rubbed and developed central ulceration after a few days. He received no special treatment from a local hospital.

One month ago, a firm lump, which caused pain, was found deep in the back of his left thigh, and its size was similar to that of a walnut. In the past month, the lump significantly increased to approximately 1.5 times its original size. The parents reported that the patient felt significant pain in the left thigh mass, and he refused to be touched in this area.

Physical examination revealed scattered red patches across his body. A round mass with a white scar formed after ulcer healing was observed on the right knee. The mass was purplish red in color and had a soft texture. The deep part of the left thigh was palpable with a mass of approximately 3 × 4 × 3 cm, and the mass had a moderate hardness, an irregular shape, and an unclear boundary. Movements of the bilateral thigh could not be checked because the child was not cooperative (Fig. 1A–D).

Color Doppler sonography completed one week prior detected reticulated echoes and abundant blood flow signals from the right knee mass. The results also revealed diffuse thickening of the subcutaneous tissue behind the left thigh and a small amount of blood flow.

To evaluate the mass, routine blood tests and indicators related to coagulation (e.g. platelet count, fibrinogen concentration, and D-dimer level) were performed to evaluate thrombocytopenia, consumptive coagulopathy and hypofibrinogenemia. The D-dimer level was 1.17 mg/l FEU (reference range: <0.55 mg/l FEU), and the fibrinogen level and platelet count level were within normal ranges. To evaluate the effect of sirolimus, laboratory tests were also performed to measure liver and kidney function, and no significant abnormalities were found.

To further clarify the size and depth of the mass, the child underwent magnetic resonance imaging (MRI) of the lower extremities. The results showed an irregular mass in the muscle, measuring approximately 3.6 × 5.3 × 3.7 cm, with slight atrophy in adjacent muscles and no damage to adjacent bone. The mass in the posterolateral posterior thigh was isointense relative to the adjacent muscle on T1-weighted imaging and hyperintense on T2-weighted imaging (Fig. 2A).

2.2. Patient 2

A 2-month-old female was referred to our outpatient clinic with one irregular red patch on the left side of her face and a mass just beneath. At birth, she had well-defined red patches extending from the corner of the left mouth to the left ear and a small number of well-defined red patches extending to the left side of the neck. In addition, a large blue–purple mass was found inside her mouth, and her gums were deformed. As the disease progressed, the patient developed significant feeding difficulties. She was the only child in her family, and her parents reported no family history of vascular diseases.

Physical examination revealed a mass with moderate hardness on the left side of the patient's face, and the mass had irregular morphology and unclear borders. The deep part of the lump was not palpated (Fig. 3A and D).

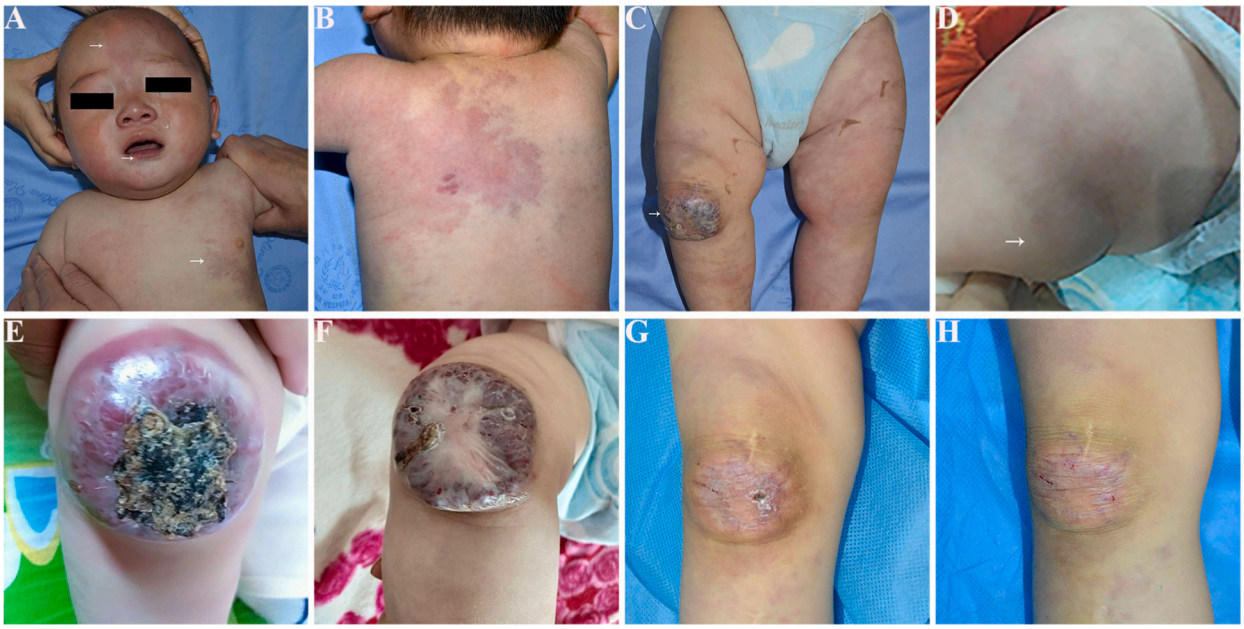

Fig. 1. Vascular diseases at different sites in Patient 1 before and after treatment. (A) CM on the forehead and anterior chest wall. (B) CM on the back. (C) CH on the right knee. (D) A firm mass was located deep in the left thigh. **The appearance of the right knee mass changed over time.** (E) The CH was ruptured and crusted. (F) The CH partially subsided by 1 year of age. (G) By 2 years of age, the mass did not completely subside. (H) At the age of 3, the appearance did not significantly change. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

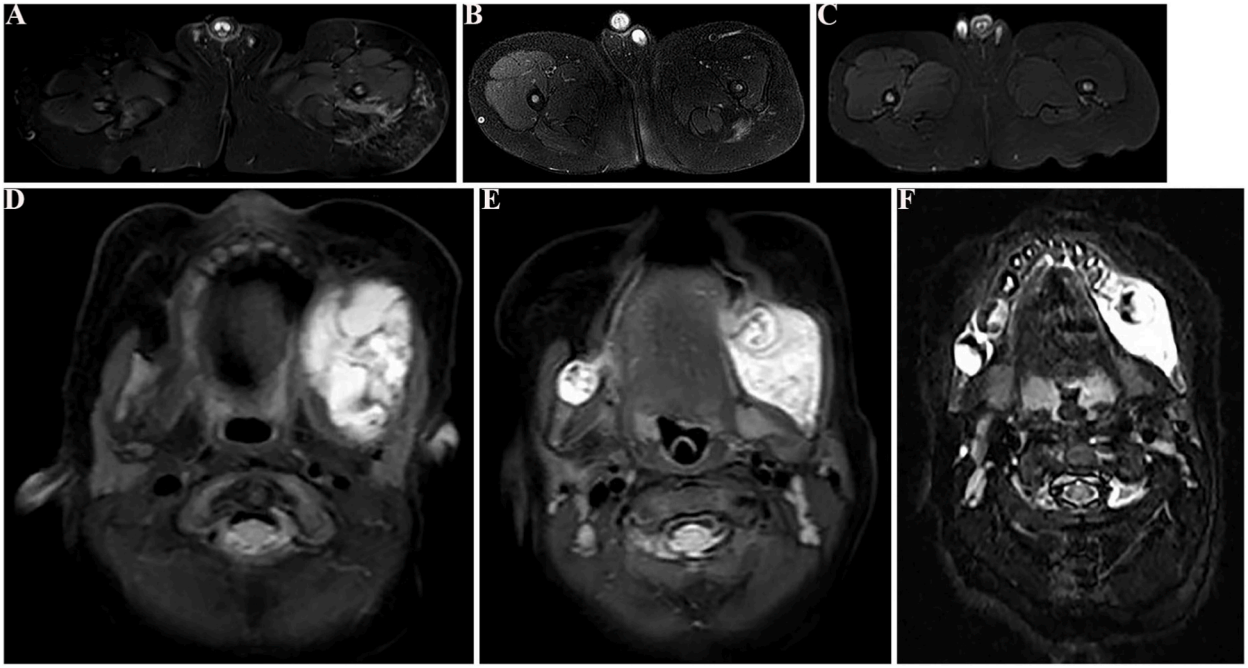

Fig. 2. MRI analysis of both. (A) The mass in the posterolateral posterior thigh was isointense relative to the adjacent muscle. (B) The mass gradually shrank. (C) Most of the mass completely subsided after continuous treatment. (D) An irregularly shaped and mixed signal mass with bone destruction of the left mandible was found on T2-weighted MRI. (E) Horizontal T2-weighted imaging showed that the signal became uniform and shrank in size. (F) Horizontal T2-weighted imaging showed that the mass significantly shrank.

Laboratory tests revealed a D-dimer level of 5.00 mg/l FEU (reference range: <0.55 mg/l FEU) and a fibrinogen level of 1.52 g/l (reference range: 2.0–4.0 g/l). The platelet count level was within the normal range. No obvious abnormalities were found in the other laboratory tests.

MRI revealed a 4.3 × 4.1 × 3.1 cm mass of hyperintensity on T1-weighted and T2-weighted images, which was accompanied by bone destruction of the left mandible. A normal soft tissue structure was visible between the CM and KHE (Fig. 2D).

The patients' personal history (including birth, feeding, vaccination, growth and development history) showed no obvious abnormalities.

2.3. Diagnostic assessment

The deep masses, which had irregular shapes, and unclear boundaries, of both patients caused obvious pain, and affected normal function, which indicated that the masses were unlikely to be simple benign tumors. Based on the clinical presentation, the masses were considered malignant, but a specific diagnosis could not be made without biopsy. Pathological biopsies were then performed to confirm the diagnoses. All the tissues from the biopsy were sent to the Pathology Department for hematoxylin-eosin (HE) staining and immunohistochemical (IHC) staining.

The pathological findings confirmed the pathological diagnosis of KHE. HE staining showed infiltrating, defined, rounded, and confluent nodules composed of spindle endothelial cells (Fig. 4A and E). IHC showed that these cells were positive for CD31, CD34, and D2–40 vascular endothelial markers but negative for glucose transporter-1 (GLUT-1) and human herpes virus-8 staining. A small number of cells were Ki–67 positive (Fig. 4B–D, F–H).

Patient 1 was ultimately diagnosed with CM (also known as nevus flammeus), KHE and congenital hemangioma (CH). With the large area of CM on the face of the child and given the possibility of Sturge–Weber syndrome (SWS), he underwent a magnetic resonance angiography of the head, and the results showed that there was no obvious abnormality thus ruling out SWS. Patient 2 was eventually diagnosed with CM and KHE with bone destruction of the left mandible.

The MDT team recommended to first treat KHE, followed by photodynamic therapy to treat CM. To further clarify the etiology and aid treatment, whole exome sequencing (WES) was suggested, but the parents of Patient 2 refused to complete WES.

2.4. Therapeutic intervention, follow-up, and outcomes

After the diagnosis of KHE was confirmed, both patients received standardized oral sirolimus treatment [8]. The starting dose of sirolimus was 0.6 mg/m^2, which was administered orally twice daily and subsequently titrated to achieve trough levels of 5–8 ng/ml. Regular follow-up every year showed that the KHE significantly subsided (Fig. 2B and C, E and F), and the D-dimer level, which is an

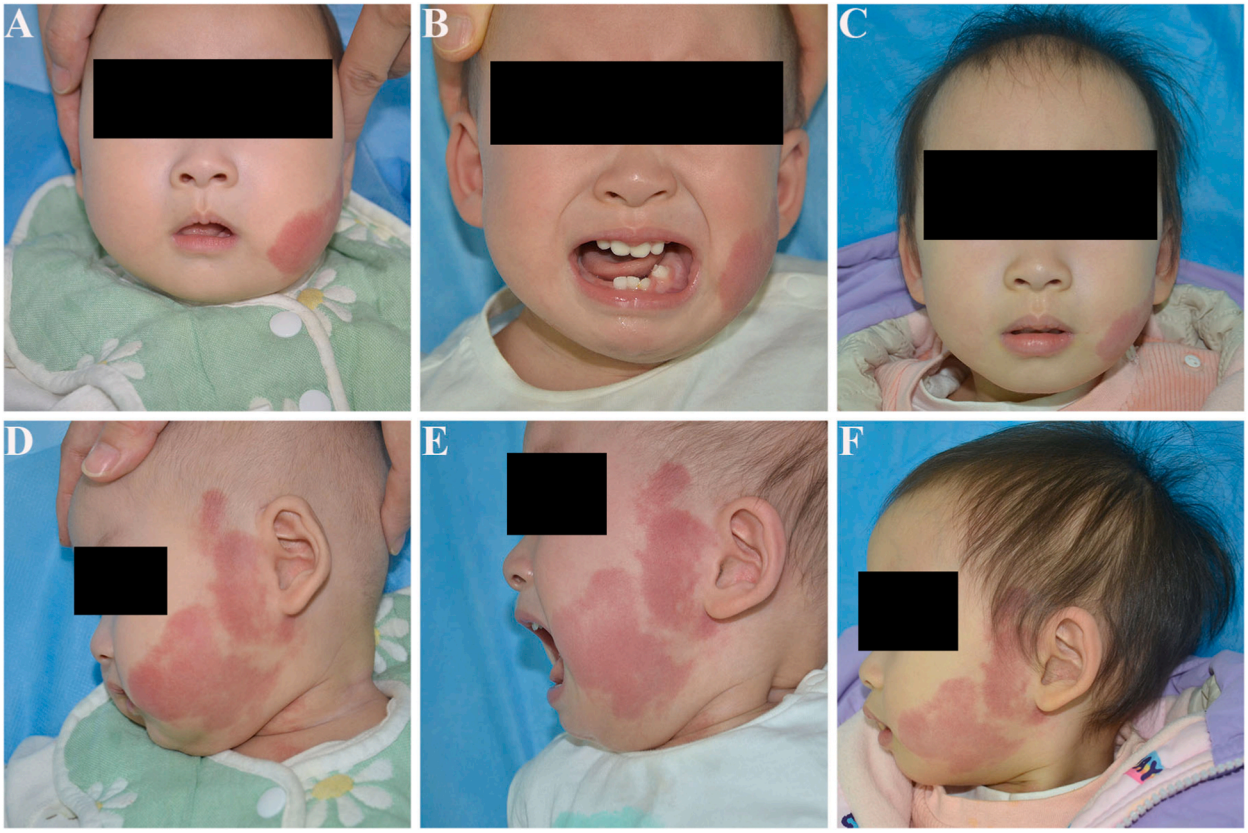

Fig. 3. Irregular red patches on the left side of the face and one hard mass beneath Patient 2 before and after treatment. (A) Asymmetry of the patient's face was observed. (B) The deep mass interfered with the normal alignment of the teeth. (C) After continuous treatment, the face returned to symmetrical. (D) Irregular red patches on the left side of the face showed little change. (E) The red patches grew in proportion to the patient's growth. (F) The irregular red patches showed little change. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

important indicator of KHE activity, was also significantly decreased in both patients.

During the course of follow-up, the lump on the right knee of Patient 1 was decreased in size and thickness within the first 20 months, with residual lesions that maintained a red–purple color, telangiectasia and prominent veins (Fig. 1E–H). For Patient 1, the diagnosis was revised to partially involuting congenital hemangioma (PICH). The CM on the left side of Patient 2's face did not show significant changes, the deep mass gradually shrank, and her face gradually became symmetrical (Fig. 3B and C, E and F).

2.5. WES

For identification of somatic gene alterations, DNA was extracted from fresh biopsy sections and sequenced via WES.

Interestingly, the results showed a somatic mutation in CDC27 c.1494A > C (p. L498F) in both CM and PICH and a somatic mutation in PABPC1 c.619C > T (p. L207F) in both KHE and PICH.

To further investigate the germline gene alterations, DNA was extracted from the peripheral blood of Patient 1 and his parents. After analysis, however, no suitable germline mutations were found to explain the simultaneous occurrence of the three vascular diseases.

3. Discussion

Few studies have reported the relatively common coexistence of vascular tumors and vascular malformations, such as pyogenic granuloma (PG) arising with CM and PG arising in a CH [9,10]. Combined capillary-venous-lymphatic malformations without overgrowth in patients with Klippel-Trénaunay syndrome have been reported [11]. To date, there are no such reports of KHE, an extremely rare vascular tumor occurring in the same or similar sites, coexisting with vascular malformation.

Considering the extremely low incidence of KHE, the incidence of KHE occurring simultaneously with multiple vascular diseases is approximately one in a million, indicating that the present patients are very rare.

The pathogenesis of the two patients could not be revealed simply according to the clinical manifestations, laboratory results, and

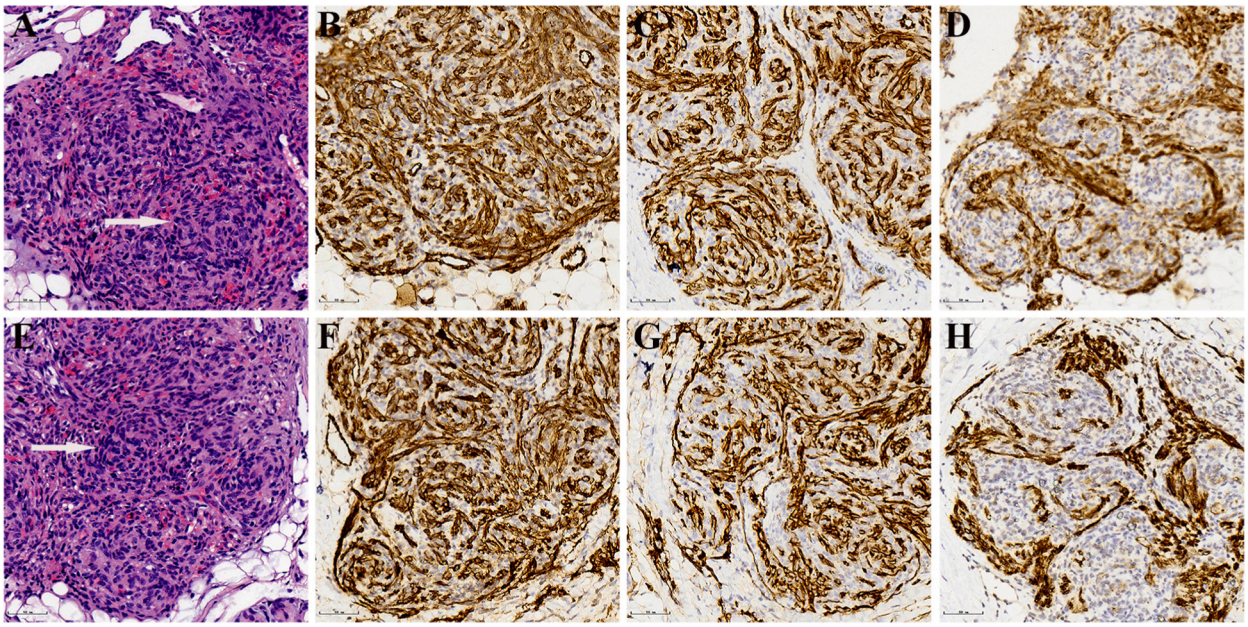

Fig. 4. Specimens from Patients 1 and 2. Patient 1. (A) Spindle cells were distributed in clusters of specimens (H&E staining, magnification × 400). Scale bar: 50 μm. (B) Spindle cells were positive for CD31 (magnification × 400). Scale bar: 50 μm. (C) Immunostaining with an anti-CD34 antibody showed that the spindle cells were positive for CD34 (magnification × 400). Scale bar: 50 μm. (D) Immunostaining of D2-40 (magnification × 400). Scale bar: 50 μm. **Patient 2**. (E) Spindle cells were distributed in clusters (H&E staining, magnification × 400). Scale bar: 50 μm. (F) Spindle cells were positive for CD31 (magnification × 400). Scale bar: 50 μm. (G) Immunostaining with an anti-CD34 antibody showed that the spindle cells were positive for CD34 (magnification × 400). Scale bar: 50 μm. (H) Immunostaining of D2-40 (magnification × 400). Scale bar: 50 μm.

imaging results, raising questions about whether such a phenomenon is merely accidental and whether there are genetically related factors involved.

To date, most of the genetic mutations found to be associated with vascular disease are concentrated in the angiopoietin/TIE2, phosphoinositide 3-kinase (PI3K)/protein kinase B (AKT)/mammalian target of rapamycin (mTOR) and other signaling pathways. These signaling pathways often regulate angiogenesis, cell proliferation, and cell apoptosis through abnormal proliferation, dysregulated apoptosis and uncontrolled angiogenesis [12,13]. The location of the mutation in the gene, cell types affected, local stimuli from chemical and biological factors, and stage of development all play important roles in the development of the disease. In addition, epigenetic factors, such as genome-wide methylation, are involved [14]. Thus, different genetic mutations can cause the same vascular disease, and different vascular diseases can be caused by the same genetic mutation.

The results of WES are worth considering. Considering the particularity of this patient, we initially hoped to find suitable germline mutations that could explain these three vasculature diseases at the same time; unfortunately, no relevant results were found. However, the somatic mutations indicated that there may be multiple genetic mutations involved in the development of one vascular disease, and the results confirmed our previous hypothesis that a vascular disease can be associated with multiple gene mutations and that the same gene mutations can occur in different vascular diseases [15].

A somatic second hit that generates a completely localized loss-of-function of the protein in the lesions cannot be ruled out. In addition, the involvement of multiple possible causative factors, such as external physicochemical factors received locally before the disease started, cannot be excluded [12]. A larger clinical sample size and basic experiments involving genetic mechanisms are needed for further validation.

A previous study revealed that somatic mutations in GNA14 are present in one-third of KHE patients [16]. A patient with congenital KHE harboring a PIK3CA mosaic pathogenic variant has been reported [17]. RASA1 and AKT3 mutations have also been reported in patients with capillary malformation-arteriovenous malformation [18,19]. Mutations in GNAQ, GNA11, and GNA14 have been demonstrated to be associated with CH [16,20,21]. These reports suggest that various genetic mutations in vascular diseases cannot be detected or reported due to current technical hurdles. Combining the above factors, we believe that the coexistence of KHE and CM is more than a coincidence.

For a long time, there has been little research on CH, and PICH has gradually received increasing amounts of attention. Rapidly involuting congenital hemangioma (RICH) generally involutes completely during 6–14 months after birth [22–24]. In the present case report, the mass on the patient's right knee was still observed with significant residual tumor tissue and dilated blood vessels after 2 years of age, resulting in the diagnosis of PICH.

As a target of mTOR, sirolimus is an ideal antiproliferative agent for progressive KHE through the control of tissue overgrowth disorders caused by inappropriate activation of the PI3K/AKT/mTOR pathway. Furthermore, oral sirolimus treatment achieves favorable responses in KHE patients, especially those who are refractory to or unsuitable for other therapies, such as steroids, VCRs,

and CTXs [25]. Changes in the condition of the two patients in the present study confirmed the efficacy of sirolimus in the treatment of KHE. It is important to note that despite good short-term results, long-term follow-up is still needed to closely monitor long-term effects and sequelae [26].

Treatment of CM should be tailored to each patient and requires a combination of minimizing psychosocial impact, minimizing potential tissue hypertrophy, and minimizing the family's economic considerations [7]. In addition, both of the present patients were younger than 3 years old, and it was difficult to position the patients and protect their eyes during photodynamic treatment for CM. Among the vascular diseases these patients currently suffer, KHE is more serious than the other diseases and can be life-threatening without proper treatment. After the MDT and full communication, the parents decided to have their children receive CM photodynamic therapy after the KHE tumors size significantly decreased and was stably controlled for at least 1 year.

There are few drugs that are effective for treating CM, and pulsed laser therapy remains an ideal option for treatment; however, the recurrence rate is relatively high [27]. A new subtype of CH, tardive expansion congenital hemangioma (TECH), has recently been reported [28]. Treatment modalities for different subtypes of CH need to be carefully evaluated on a case-by-case basis [29,30]. The ideal drug for the treatment of KHE is sirolimus, and both single and combined medications of sirolimus have been shown to have good efficacy [25,26]. Although the current understanding of vascular diseases is limited, the continuous advancement of science and technology will increase the understanding of the pathogenesis, diagnosis, and treatment of vascular diseases.

The diagnostic and treatment of these two patients are worth considering. The treatment of multiple vascular diseases should be staged and individualized, and MDT plays an important role in this process. The diagnosis of such patients is difficult, and treatment requires time, placing greater demands on the patient, the patient's family, and the involved doctors. In addition, regular follow-up of Patient 1 provided an accurate and comprehensive understanding of the clinical features of PICH.

The diagnosis and treatment of such patients will provide a molecular basis for the pathogenesis of this disease and a reference for colleagues worldwide.

4. Conclusion

This article is the first to report a case series in which KHE coexisted with CM, and the relevant results suggested that these two conditions can be considered more than a coincidence.

The present research highlighted the importance of the diagnosis, treatment, and management of similar complex vascular diseases, which requires the participation of MDTs.

Ethics declaration

This study was approved by the Ethics Committee of the West China Hospital of Sichuan University (approval number: 2020–111; approval date: April 21, 2020).

Both patients' legal guardians provided informed consent for the publication of their anonymized case details and images.

Data availability statement

The data associated with the present study have not been deposited into a publicly available repository. The datasets generated and/or analyzed during the present study are available from the corresponding author upon reasonable request.

CRediT authorship contribution statement

Xue Gong: Writing – original draft, Methodology, Investigation, Data curation. **Jiangyuan Zhou:** Writing – original draft, Validation, Project administration, Methodology, Investigation, Formal analysis. **Siyuan Chen:** Writing – original draft, Validation, Funding acquisition, Data curation. **Yi Ji:** Writing – review & editing, Supervision, Project administration, Funding acquisition, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:We declare that Yi Ji is a Section Editor of Heliyon.

Acknowledgments

This work was supported by the National Natural Science Foundation of China (grant number 82273556).

References

[1] M. Wassef, F. Blei, D. Adams, et al., Vascular anomalies classification: recommendations from the international society for the study of vascular anomalies, Pediatrics 136 (1) (2015) e203–e214.

[2] S.E. Croteau, M.G. Liang, H.P. Kozakewich, et al., Kaposiform hemangioendothelioma: atypical features and risks of Kasabach-Merritt phenomenon in 107 referrals, J. Pediatr. 162 (1) (2013) 142–147.
[3] A.I. Rodríguez Bandera, D.F. Sebaratnam, O. Wargon, L.F. Wong, Infantile hemangioma. Part 1: epidemiology, pathogenesis, clinical presentation and assessment, J. Am. Acad. Dermatol. 85 (6) (2021) 1379–1392.
[4] C. Léauté-Labrèze, J.I. Harper, P.H. Hoeger, Infantile haemangioma, Lancet (London, England) 390 (10089) (2017) 85–94.
[5] O. Enjolras, J.B. Mulliken, Vascular tumors and vascular malformations (new issues), Adv. Dermatol. 13 (1997) 375–423.
[6] Q. Venot, T. Blanc, S.H. Rabia, et al., Targeted therapy in patients with PIK3CA-related overgrowth syndrome, Nature 558 (7711) (2018) 540–546.
[7] S. Sabeti, K.L. Ball, C. Burkhart, et al., Consensus statement for the management and treatment of port-wine birthmarks in sturge-weber syndrome, JAMA Dermatol. 157 (1) (2021) 98–104.
[8] Y. Ji, S. Chen, K. Yang, et al., A prospective multicenter study of sirolimus for complicated vascular anomalies, J. Vasc. Surg. 74 (5) (2021) 1673–1681.e1673.
[9] M.C. Garzon, O. Enjolras, I.J. Frieden, Vascular tumors and vascular malformations: evidence for an association, J. Am. Acad. Dermatol. 42 (2 Pt 1) (2000) 275–279.
[10] B. Barrick, J. Lehman, M. Tollefson, Agminated pyogenic granuloma-like growth arising in a congenital hemangioma, JAMA Dermatol. 150 (7) (2014) 781–783.
[11] E. Brandigi, G. Torino, M. Messina, et al., Combined capillary-venous-lymphatic malformations without overgrowth in patients with Klippel-Trénaunay syndrome, J. Vasc. Surg.: Venous Lymphat. Disord. 6 (2) (2018) 230–236.
[12] A. Queisser, E. Seront, L.M. Boon, M. Vikkula, Genetic basis and therapies for vascular anomalies, Circ. Res. 129 (1) (2021) 155–173.
[13] A.K. Greene, J.A. Goss, Vascular anomalies: from a clinicohistologic to a genetic framework, Plast. Reconstr. Surg. 141 (5) (2018) 709e–717e.
[14] R.W. Ten Broek, C. Koelsche, A. Eijkelenboom, et al., Kaposiform hemangioendothelioma and tufted angioma - (epi)genetic analysis including genome-wide methylation profiling, Ann. Diagn. Pathol. 44 (2020) 151434.
[15] Y. Ji, S. Chen, K. Yang, C. Xia, L. Li, Kaposiform hemangioendothelioma: current knowledge and future perspectives, Orphanet J. Rare Dis. 15 (1) (2020) 39.
[16] Y.H. Lim, A. Bacchiocchi, J. Qiu, et al., GNA14 somatic mutation causes congenital and sporadic vascular tumors by MAPK activation, Am. J. Hum. Genet. 99 (2) (2016) 443–450.
[17] D. Carli, S. Kalantari, R. Manicone, et al., Kaposiform hemangioendothelioma further broadens the phenotype of PIK3CA-related overgrowth spectrum, Clin. Genet. 100 (5) (2021) 624–627.
[18] N. Revencu, E. Fastre, M. Ravoet, et al., RASA1 mosaic mutations in patients with capillary malformation-arteriovenous malformation, J. Med. Genet. 57 (1) (2020) 48–52.
[19] A. Bolli, B. Nriagu, A.D. Britt, et al., Mosaic pathogenic variants in AKT3 cause capillary malformation and undergrowth, Am. J. Med. Genet. 191 (5) (2023) 1442–1446.
[20] F. Galeffi, D.A. Snellings, S.E. Wetzel-Strong, et al., A novel somatic mutation in GNAQ in a capillary malformation provides insight into molecular pathogenesis, Angiogenesis 25 (4) (2022) 493–502.
[21] U.M. Ayturk, J.A. Couto, S. Hann, et al., Somatic activating mutations in GNAQ and GNA11 are associated with congenital hemangioma, Am. J. Hum. Genet. 98 (6) (2016) 1271.
[22] E. Nasseri, M. Piram, C.C. McCuaig, V. Kokta, J. Dubois, J. Powell, Partially involuting congenital hemangiomas: a report of 8 cases and review of the literature, J. Am. Acad. Dermatol. 70 (1) (2014) 75–79.
[23] P.W. Lee, I.J. Frieden, J.L. Streicher, T. McCalmont, A.N. Haggstrom, Characteristics of noninvoluting congenital hemangioma: a retrospective review, J. Am. Acad. Dermatol. 70 (5) (2014) 899–903.
[24] G. Gorincour, V. Kokta, F. Rypens, L. Garel, J. Powell, J. Dubois, Imaging characteristics of two subtypes of congenital hemangiomas: rapidly involuting congenital hemangiomas and non-involuting congenital hemangiomas, Pediatr. Radiol. 35 (12) (2005) 1178–1185.
[25] Y. Ji, S. Chen, J. Zhou, et al., Sirolimus plus prednisolone vs sirolimus monotherapy for kaposiform hemangioendothelioma: a randomized clinical trial, Blood 139 (11) (2022) 1619–1630.
[26] J. Zhou, Y. Li, T. Qiu, et al., Long-term outcomes of sirolimus treatment for kaposiform hemangioendothelioma: continuing successes and ongoing challenges, Int. J. 153 (3) (2023) 600–608.
[27] L. Liu, X. Li, Q. Zhao, L. Yang, X. Jiang, Pathogenesis of port-wine stains: directions for future therapies, Int. J. Mol. Sci. 23 (20) (2022).
[28] C. Hua, L. Wang, Y. Jin, et al., A case series of tardive expansion congenital hemangioma: a variation of noninvoluting congenital hemangioma or a new hemangiomatous entity? J. Am. Acad. Dermatol. 84 (5) (2021) 1371–1377.
[29] Z. Ren, S. Sun, Z. Ye, J. Yang, Congenital hemangioma causing heart failure, Intensive Care Med. 45 (6) (2019) 889–891.
[30] X. Gong, Y. Li, K. Yang, S. Chen, Y. Ji, Infantile hepatic hemangiomas: looking backwards and forwards, Precis. Clin. Med. 5 (1) (2022) pbac006.