A mass not so harmless

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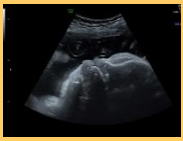
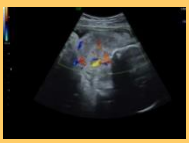
CLINICAL CASE

- Well-being male fetus, normal pregnancy.
- Routine ultrasonography unspecific at 36 weeks of gestation.
- At 38 weeks, discovery of a right **voluminous cervicofacial mass**. Typical aspect of a vascular tumor, looking like non constrictive and fast-growing.





The C-section delivery is quickly planed in the referral materno-fetal intensive care unit center, involving a multidisciplinary team.

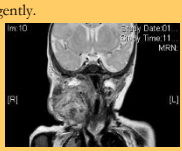
At birth :

The newborn breathes spontaneously but presents severe hypoxemia. The huge purple mass is firm and non-painful. A diffuse petechial rash is noted.

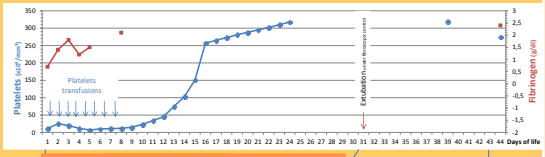
Direct laryngoscopy shows a left shift of the upper airway tract and laryngeal structures invasion by the hemangioma. **Active bleeding** is at once significant.

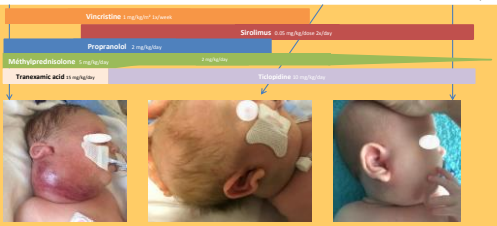
Laryngeal mask ventilation is performed until intubation under video-laryngoscopic control can be succeeded.
Umbilical venous catheter is placed to ensure hemodynamics and comfort.

Heavy bleeding appears at catheter site, blood and platelets transfusion are given urgently.



Coronal T2-weighted-MR-images demonstrate a vascular mass, involving the parapharyngeal and retro-pharyngeal spaces and the floor of the mouth. We note a lateral deviation of the oropharynx and the larynx with reduction of the respiratory tracts.





Evolution :

Immediate

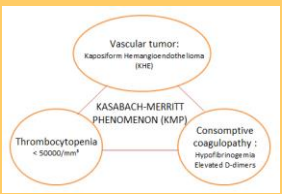
- Moderate anemia (Hb 10.4 g/dl), **profound thrombocytopenia** (11000/mm³) **+ coagulation disorders** (fibrinogen 0,7 g/dl, D-Dimers level > 4000 µg/L)
  Diagnosis of KASABACH-MERRIT phenomenon

- Tritherapy start (Vincristine-Propranolol-Methylprednisolone) since day 1 according to the severe life-threatening condition.
- Platelets transfusions (when less than 20000/mm³) are given until day 8 of life because of heavy invasive support and expected drug delay efficiency.
  No improvement of platelets count or majoration/regression of the mass.

Late

- **Sirolimus** introduction at day 8 of life.
  Normalization of platelets count in 1 week and visible tumor involution.
- Successful first extubation after fibroscopic control at the 5th week of life.
- Continuation of Sirolimus for months.

Diagnosis of the Kasabach-Merritt Phenomenon :



KHE: firm infiltrative and solitary vascular tumor located in the skin or soft tissue, usually seen in infancy.
KMP: coagulopathy complicating mainly the KHE. The intensity of thrombocytopenia seems related to the extent of tumor infiltration.

Epidemiology :

- Less than 1 birth per million.
- No gender or ethnicity predominance.
- Frequent in first weeks of life (prenatally diagnosis increase disease severity).
- Preferantial location : lateral neck, axilla, groin, extremities, trunk.

Physiopathology hypothesizes:

Abnormal platelet activation and aggregation in contact to an abnormal tumor endothelium and/or turbulent blood flow in the small convoluted capillaries.

→ localized trapping of platelets and consumption of clotting factors.

Treatment : No clear consensus, but

- Complete surgical resection when possible (partial recurrence)
- If not, first-line drugs :

  Vincristine 0,05 mg/kg Once weekly (central line) **AND**

  oral Prednisolone 2 mg/kg/d or IV **Methylprednisolone** 1,6 mg/kg/d

- **Or SIROLIMUS** (inhibitor of the mammalian target of rapamycin)
  Antiproliferative and antiangiogenetic agent.
  Improves rapidly the hematopoietic parameters.
  Acceptable side effects : hyperglycemia, hyperlipidemia, lymphopenia.
- Others:

  Propranolol (with corticosteroids, best in infantile hemangioma)

  Interferon-α (toxicity!)

  Antiplatelets agents (efficacity on inflammation and pain)

  Embolization, rarely realizable

  Radiation therapy, inefficient

- RESTRICTED PLATELETS TRANSFUSION only for active bleeding or prior to surgery
  Short half-live owing to intraregional trapping and destruction.
  Exacerbates the KMP, increasing pain and enlargement of the tumor.
  Stimulates endothelial proliferation by release of pro-angiogenicGF.

Prognosis :

- High mortality rate (10-30%), correlated to haemorrhagic complications.
- Residual lesions: pseudo-fibrosis, inflammatory surge or bone/muscle sequelae and permanent coagulopathy.

CONCLUSION :

A fast-growing vascular mass which is high located should always be feared. The delivery must be programmed in a materno-fetal intensive care unit center, where a **multidisciplinary** support can be proposed. An Exit procedure could also be evoked in an experimented unit.
KASABACH-MERRITT is a life-threatening phenomenon characterized by severe thrombocytopenia and consumptive coagulopathy. It is a common complication of a rapidly enlarging rare vascular tumor known as kaposiform hemangioendothelioma (KHE).
To this day, there is no consensus regarding the treatment but emerging drugs as **Sirolimus** seem to be efficient. Our experience corroborates with reported fast and spectacular effects on the platelets count and the mass size. Its oral administration and apparent safety profile are also attractive.
Platelets transfusion should be avoided at best, considering the risk to worsen the situation and enlarge the mass.

Ref : 1. BOCCARA O, FRAITAG S, LASNE D et al. Kaposiform Haemangioendothelioma-spectrum Lesions with Kasabach-Merritt Phenomenon : Retrospective Analysis and Long-term Outcome. Acta Derm Venereol. 2016;96:77-81
2. DROLET B, TRENOR C, BRANDAO L et al. Consensus-Derived Practice Standards Plan for Complicated Kaposiform Hemangioendothelioma. J Pediatr.2013 Jul;163(1):285-91
3. LACKNER H, KARASTANEVA A, SCWINGER W et al. Sirolimus for the treatment of children with various complicated vascular anomalies. Eur J Pediatr. 2015. 174:1579-84