Embolization is helpful if done right: Technical tips from a high altitude high volume ecuadorian center

Oscar Ojeda MD
Vascular Surgeon
Department of Vascular Surgery
Hospital Eugenio Espejo, Quito-Ecuador

CAROTID BODY TUMORS (CBTs)

- Paragangliomas of extra-adrenal neuroendocrine system.
- They represent 70% of all cervical paragangliomas and 0.6% of head and neck tumors.
- More common in women in the fourth to sixth decades of life.
- Bilateral in 5% of cases.
- Malignancy in 5% of cases.
- Clinical presentation: asymptomatic cervical mass.

WHAT IS THE ETIOLOGY OF CBTs?

- CBT is caused by mutations in the gene for succinate dehydrogenase D (SDHD)
- The chronic hypoxia causes sporadic CBTs. The SDHD gene may be involved in oxygen sensing.
- High altitudes and nonsense/splicing mutations are associated with phenotypic severity in CBTs and support the hypothesis that SDHD mutations impair oxygen sensing.
CLASSIFICATION OF CBTs

- Sporadic (very common)
- Hereditary (10%)

SHAMBLIN CLASSIFICATION

- **SHAMBLIN I**: Small tumors, easy to resect.
- **SHAMBLIN II**: Bigger tumors and adhesion to adventitia of carotid. We need subadventitial technique.
- **SHAMBLIN III**: Intramural invasion of carotid artery, frequently we need vascular reconstruction, bypass or patch.

NEW CLASSIFICATION

- Dr. Balcázar from Bolivia proposes a new classification:
  - **Stage A**: small tumors, less than 3 cm, no invasion, easy to resect, diagnosis only with ultrasound. If the patients is very old we can only observe its evolution.
  - **Stage C**: Extension tumor (cephalic, caudal, lateral), during the surgery frequently there is nerve damage. CT scan is preferred to see the carotid invasion. Embolization would be aid.
  - **Stage D**: Tumors that involve adjacent structures, esophagus, skull base. They are symptomatic (dysphonia, dysphagia, headache, pain). Possible permanent involvement of cranial nerves after surgery. CT scan is the best imaging study. Frequently the resection needs bypass or patch.
CAROTID BODY TUMORS
EUGENIO ESPEJO HOSPITAL
2013 - 2017

- Patients: 59  Tumors: 62
- Age: 52 (28 – 72)  Gender: Female 89%
- Size tumor: 3.91 cm (2.5 – 7)
- Side: Left 44%, Right 48%, Bilateral 5%
- Mortality: 0%
- Complications: 11 pts (18.6%). Tears, hematoma.
- Post-op neurologic complications: 8/59 (13%). Disphonia, cranial nerves dysfunction.
- Blood loss: 282 cc (50 – 2500)
- Malignancy: 1 (1.6%)
- Surgical time: 154 minutes (60 – 480)
- Size tumors for embolization: 4.8 cm  8 cases
- Blood loss after embolization: 180 cc (150 – 1000)
- Surgical time after embolization: 240 minutes
- Recurrence: 1 case

TREATMENT

- SURGICAL RESECTION
- Embolization + Surgical Resection
- Only Embolization
- Radiotherapy??

PREOPERATIVE EMBOLIZATION

- Catheter directed embolization by ascending pharyngeal artery or the major vessel.
- Direct puncture of the tumor.
- Onyx or coils.
WE RESECT THE TUMORS 48 HOURS AFTER THE EMBOLIZATION

SURGICAL RESECTION
Bilateral Carotid Body Tumors require resection with a period at least 3 weeks between each surgery to avoid the Baroreflex Failure Syndrome.

CONCLUSIONS
- The Carotid Body Tumor is an uncommon disease more prevalent in high altitude cities.
- The diagnosis is mainly clinical supported with imaging studies.
- The surgical procedure must be performed by a surgeon with experience in carotid reconstruction techniques and management of vascular and nervous bundle of the neck, to thereby reduce patient morbidity and mortality.
- The surgical resection is the definitive treatment and the preoperative embolization would be aid in tumors bigger than 4cm.
- The surgical resection must be performed after 48 or 72 hours after the embolization.

THANKS
oscarle1942@gmail.com