HCC
Paraneoplastic Syndromes

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Incidence

• Occur in 43.6% of 165 HCC patients

• Hypercholesterolemia: 14.5%
• Erythrocytosis: uncommon

• Hypoglycemia: 12.7%
• Hypercalcemia: 7.8%

• > 2 syndromes: 8.5%
Clinical Significance

- Shorter survival (except erythrocytosis)
- Younger patients
- Higher rate of portal vein thrombosis
- Higher rate of bilobar tumors
- Higher rate of tumors $>10$ cm
- More likely to have higher AFP
- Patients less likely to be candidates for treatment

Clinical Significance

- Elderly man with massive HCC and paraneoplastic syndrome (erythrocytosis and hyperlipidemia)

- Treated by intraarterial chemotherapy and hepatic resection
Clinical Significance

- Possible tumor markers:
  - Serum erythropoietin
  - Erythropoietin mRNA
  - Total cholesterol

Successful Treatment in a Case of Massive Hepatocellular Carcinoma with Paraneoplastic Syndrome.
Hypoglycemia

• **Type A:**
  - Mild, asymptomatic
  - Due to hepatic dysfunction

• **Type B:**
  - in <5%
  - Due to tumor secretion of insulin-like growth factor-II

*Glucose utilization in a patient with hepatoma and hypoglycemia. Assessment by a positron emission tomography.*

*Hepatoma with severe non-islet cell tumor hypoglycemia.*
Erythrocytosis

• Due to tumor secretion of Erythropoietin (EPO)
• High EPO present in up to 23% of patients
• Elevation in hemoglobin concentration is uncommon

**Thrombocytosis**

- Due to tumor secretion of TPO (serum thrombopoietin)
- Platelet count and serum TPO dropped significantly after tumor resection and re-elevated after tumor recurred

Hypercalcemia

- Sometimes associated with osteolytic metastasis
- May be present in the absence of bony metastasis due to secretion of parathyroid hormone-related protein
Watery Diarrhea

- Patients with HCC may present with watery diarrhea
- Mechanism: may be related to secretion of peptides that cause intestinal secretion (e.g., VIP, gastrin)

Diarrhea as a presenting symptom of hepatocellular carcinoma.
Bruix J. et al.

Hepatocellular carcinoma presenting with intractable diarrhea. A radiologic-pathologic correlation.
Steiner E. et al.
Cutaneous Features

- Dermatomyositis
- Pemphigus foliaceus
- Sign of Leser-Trelat
- Pityriasis rotunda
- Porphyria cutanea tarda (PCT)
- Acanthosis nigricans

Neurological

• CIDP:
  – LL weakness, loss of proprioception
  – Biopsy (nerve and muscle) specimens: demyelination of nerve fibers and neurogenic degeneration of muscles
  – Improvement after steroid therapy

Chronic Inflammatory Demyelinating Polyneuropathy Accompanied by Hepatocellular Carcinoma.
Sugai et al. Internal Med. 1997;36(1)
Neurological

- Peripheral sensorimotor polyneuropathy and cranial nerve involvement
  - 6 months before a diagnosis of HCC

Hepatocellular Carcinoma Presenting With Paraneoplastic Neurologic Syndrome in a Hepatitis B Surface Antigen-Positive Patient.
Hatzis et al.
Others...

- Hypertension:
  - Due to overproduction of Angiotensin I by tumor
- Hypercholesterolemia
- Raynaud’s phenomenon
- Polymyositis
- Carcinoid syndrome
- Hyperthrophic osteoarthropathy
- Hyperthyroidism
Thank You.