Liver Cancer: Diagnosis and Treatment Options

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Your Liver

- Largest internal organ
- Located in the upper right side of your abdomen behind the rib cage
- Divided into right and left lobes
- Holds 13% of body’s blood supply
- Only organ that can regenerate
- You cannot live without a liver
What Does Your Liver Do?

- Removes potentially toxic by-products of certain medications
- Breaks down nutrients from food to produce energy
- Helps your body fight infection by removing bacteria from the blood
- Makes proteins that help stop bleeding from cuts and wounds
- Makes bile which is a fluid that helps you digest food
- Prevents shortages of nutrients by storing vitamins, minerals and sugar
Stages of Liver Damage

Healthy Liver  Fibrotic Liver  Cirrhotic Liver  Liver Cancer
Primary Liver Cancer

• More common to develop liver cancer that has spread from somewhere else in the body (liver metastases)
• Primary liver cancer begins in the liver itself
  • 16,000-20,000 Americans are diagnosed each year
  • Numbers are growing
  • Most common primary liver cancer is hepatocellular carcinoma (HCC)
    • Very aggressive tumor
    • Typically diagnosed late in its course
    • Median survival following diagnosis is 6-20 months
HCC Risk Factors

- Presence of cirrhosis
- Can be due to
  - Chronic hepatitis B or hepatitis C viral infection
  - Excessive alcohol use
  - Fatty liver disease (linked to diabetes and obesity)
  - Genetic liver disease (A1 antitrypsin deficiency, iron overload)
  - Autoimmune liver disease (autoimmune hepatitis, primary biliary cholangitis, primary sclerosing cholangitis)
  - Environmental toxins
HCC Rates in the United States

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HCC Rates in Texas by Race/Ethnicity

Supplementary Figure 3. Age-adjusted rates for HCC by race/ethnicity in the 5 most populous US states in 2012.
Diagnosing Liver Cancer

- Blood tests
- Abdominal ultrasound
- MRI scan
- CT scan
- Liver biopsy
Diagnosing Based on Scans—we rarely biopsy

HCC Treatment

• Depends on the size, number and location of tumor(s)
• Options
  • Ablation techniques
    • Radiofrequency ablation (RFA)
    • Percutaneous alcohol injection (PEI)
    • Cryoablation
    • Microwave ablation
  • Transarterial chemoembolization (TACE)
• Liver resection
• Oral medication
• Liver transplantation
Radiofrequency Ablation (RFA)

**Indications:**
- Unresectable/bridge
- Confined
- Child’s A or B
Radiofrequency Ablation (RFA)

- Achieves complete necrosis of up to 4 cm diameter
- RCTs showing RFA > PEI for local control of HCC > 3cm in less sessions
- CR in 55% (by explant)
- Predictors of poor response:
  - Size (< 5cm – CR 61%; > 5cm - CR 24%)
  - Infiltrative/satellite lesions
  - Poor differentiation
- Recurrence @ 1, 3, 5 yrs = 26 – 32%, 51 – 81%, 60 – 83%
- Severe complications (1 – 12%), mortality (0.1 – 0.5%), tumor dissemination 0.6%
Percutaneous Alcohol Injection (PEI)

- Long history
  - Alcohol (95%)
  - Hypertonic saline
  - NaOH (2N)
  - Acetic Acid*

Liver with HCC

May be preferable in high-risk RFA
Chemoembolization (TACE)

Liver with HCC

80-100% blood supply to tumor is arterial so chemotherapy is targeted to the tumor

“Chemo-”
- Cisplatin
- Mitomycin C
- Adriamycin
- Doxorubicin

“embolization”
- Gel-foam
- Particles
- Lipiodol

Hepatic artery
Resection
determinants:
- Extent of liver disease
- Anatomy vs tumor location

Like in real estate:
Location
Location
Location

Liver with HCC
Drugs Approved to Treat HCC (Unresectable)

- Lenvatinib (LENVIMA)
- Nivolumab (OPDIVO)
- Pembrolizumab (KEYTRUDA)
- Regorafenib (STIVARGA)
- Sorafenib (NEXAVAR)
Liver Transplantation

- Liver transplant treats HCC and underlying liver disease
- Proper patient selection yields 5 year overall survival ~75%
- Treatment related mortality is 1-5%
- Best option; however, limited supply of deceased donor organs
  - Model for End Stage Liver Disease (MELD) is complex equation that predicts mortality from complications of cirrhosis
  - Used to allocate deceased donor organs
Multidisciplinary Care

Radiology (Diag./Int.)

Transplant

Hepatobiliary Surgery

Hepatobiliary Neoplasia Team

Hepatology

Oncology

Dietician/Social Worker

Pathology

Radiation Oncology

Palliative Care
Summary

• Liver cancer is fastest growing cancer in America
• Highest prevalence in South Texas Hispanics
• Survival depends on early diagnosis
• Treatment options continue to improve with excellent survival when found early
• Requires multidisciplinary approach for ideal outcomes
• UT Health and Mays Cancer Center very involved in HCC Research to promote discovery and advance care