

Liver Disease and Special Care

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Aims

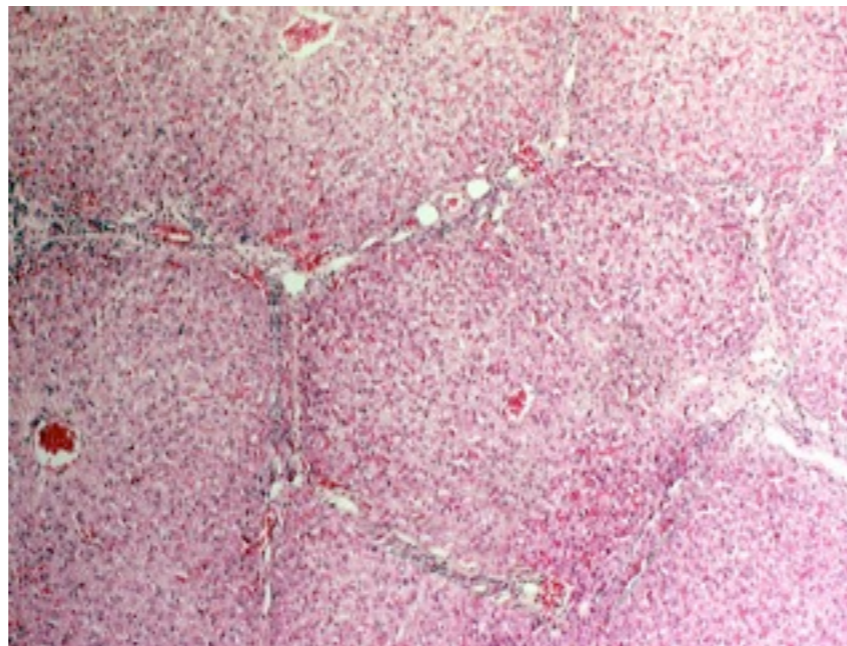
- Functions and anatomy of the liver
- Common causes of liver disease
- Clinical and physical signs
- Impact of liver disease on oral health
- Practical tips for treating patients with liver disease

The Liver

- Largest Glandular organ
- 3lbs (american football)
- Right side of abdomen
 - under diaphragm
 - over the gall-bladder
- 1/4 of body's blood flows through it every minute
- Holds 1 pint (13%) of body's blood

Chemical processing Plant

- 4 Liver lobes divided into lobules (millions)
- Lobules - rows of hepatocytes radiating out from central point



HEPATOCYTE FUNCTION

- Hepatocytes contain thousands of enzymes
- Metabolises beneficial and harmful substances
- Immune Response - Phagocytic Kupfer Cells
- excreted as bile from the liver or in the urine by the kidney

Functions of the liver

filtering the blood

- urea from excess amino acids and ammonia excreted through the kidney as urine
- making bile, a substance that helps digest fat and excrete waste products via intestine and faeces
- processing and storing sugars, helping the body transport and save energy
- protein synthesis and building of muscle
- making important proteins, such as most of the factors involved in blood clotting
- making important proteins like albumin that regulate fluid transport in the blood and kidneys.

Functions of liver

- metabolizing many medications such as barbiturates, sedatives, and amphetamines
- storing iron, copper, vitamins A D, and several of the B vitamins
- helping break down and recycle red blood cells and hormones
- part of immune system - phagocytosis and complement
- producing hormones - angiotensin (BP) thrombopoietin (platelets)

Causes of Liver Damage

- congenital birth defects, or abnormalities of the liver present at birth
- metabolic disorders or defects in basic body processes
- viral or bacterial infections
- drug misuse - alcohol and paracetamol
- certain medications that are toxic to the liver
- poisoning - toxins
- nutritional deficiencies
- secondary to other conditions
- trauma or injury

Net Result - liver disease

- Malnutrition
- Malabsorption
- Bleeding tendency
- Toxicity
- Immune-deficiency
- Impaired Homeostasis
- Metabolic chaos
- Liver stops working - death in 24 hours

Diagnosis

- Presents Late
- Medical and Social History
- Clinical Signs/Symptoms
- Physical Examination
- Palpation of liver
- FBC and clotting studies
- Liver Function Tests - enzymes and by products

Diagnosis

- Abdominal X-rays
- Ultrasounds, to show size of abdominal organs and the presence of masses
- Upper GI study, which can detect problems in the oesophagus
- Liver Biopsy
- Liver scans - radio-tagged substances to show changes in the liver structure
- ERCP- A thin tube (endoscope) is used to view structures in and around the liver.
- Abdominal CT scan or MRI

Special Care Dentistry

- Identifying patients with potential liver disease
- Spotting the physical signs of significant disease
- Procedures that need care in patients with liver disease
- Special measures
- Care for pts undergoing liver transplant

Epidemiology

Tip of the iceberg

- LD only major cause of death still increasing year-on-year
- Numbers of people with liver disease unclear
- Under reporting due to stigma
- Silent Killer - presents late with signs and symptoms
- 5th biggest killer - 15,126 died 2007
- Kills more than diabetes and road accidents combined

twice as many people died from LD in 2008 as 1991

Movements in mortality 1971-2007
Deaths per million of population



- **ALCOHOL**
 - **Binge Drinkers**
 - **High Regular Consumption**
 - **Alcohol addiction**

MECHANISM OF ACTION

- UNKNOWN
- ALCOHOL DIRECTLY TOXIC TO THE LIVER
- FREE RADICALS GENERATED AS BI-PRODUCT OF METABOLISM
- GENETIC PREDISPOSITION

Hepatitis - most common cause of chronic liver disease

- Auto-Immune Hepatitis
- Hepatitis B
- Hepatitis C
 - Blood2Blood - 50 x than HIV
 - Vertical Transmission
 - Transfusions
 - IVDU
 - Sexually transmitted

Serious public health problem

- No Vaccination
- Treatments have serious side-effects and poor compliance
- 3% of Global Population - 1% European Population (WHO)
- HCV accounts for
 - 40% stages of end stage liver disease
 - 60% new cases of Hepato-cellular carcinoma

Other patient groups

- Haemochromatosis (too much iron)
- Wilsons Disease (too much copper)
- Primary Biliary Cirrhosis (auto immune bile ducts)
- Primary Sclerosing Cholangitis (bile tubes blocked)
- Cystic Fibrosis (bile tubes blocked)

Clinical implications

- Surgery
- Local Analgesia
- Prescribing
- Pain Relief
- Sedation
- Xerostomia
- Cross-Infection

Liver damage

- Function well with 2/3 loss of structure
- Presents late with symptoms
- Only internal organ capable of natural regeneration
- Via hyperplasia and mitosis of hepatocytes
- 25% of a liver can regenerate into whole liver in 8 years

HYPER-TESTITIS!!!!

- Don't need to clotting test every patient with Hepatitis C
- Don't refer every patient with high alcohol intake
- Don't hold up necessary or urgent treatment for reassurance
- Look for relevant clinical and physical signs of liver disease first
- Take a good history

early Signs and symptoms = special measures

- Feint Jaundice
- Dark Circles
- Easy Bleeding
- Itching
- Small, spider like blood vessels - telengiactasia
- Bruising
- Dupytrens Contracture
- White Nails (hypo albumenaemia)
- Liver Flap (tremor) due to ammonia

Local measures

- Care with clotting
- Extract no more than 2 adjacent teeth
- Routinely suture and pack
- Ensure Primary haemostasis
- Consider pre-operative INR

Local analgesia

- 1st pass metabolism in the Liver
- Increased Potential for Toxicity and CNS involvement
- No more than 2-3 cartridges of LA
- Inject Slowly - 1-2ml per minute
- Use preparations with vaso-constrictor

Conscious sedation

- Relative Analgesia is safe for patients with liver disease
- Liver Disease is a relative contra-indication for intra-venous sedation which should be undertaken in a specialist centre
- Take care with oral diazepam, temazepam and midazolam
- Avoid Opiates absolutely

Antimicrobials

- Amoxicillin and Penicillin are safe to prescribe at normal dose and are preferred first line antibiotic
- Erythromycin and metronidazole are more hepato-toxic and should be prescribed at reduced doses
- Avoid tetracycline and ketoconazole

Paracetamol?

- Paracetamol preferred but at reduced doses
- Avoid aspirin, ibuprofen
- Opiates contra-indicated

Prevention

- Hepatitis C
- PBC
- Wilsons Disease
- Haemachromatosis

Fluoride - professional and home applied



universal x-infection

- 1:100 people with Hep C carriage
- Many more unaware and undiagnosed
- Good sharps routine crucial
- Routine Eye protection
- High Volume Suction

END-STAGE LIVER DISEASE

- HIGH POTENTIAL FOR LIVER FAILURE
- MEDICAL MANAGEMENT
- TRANSPLANT ASSESSMENT
- WORK-UP
- LISTING
- TRANSPLANT

CLINICAL SIGNS

failure

- PROFOUND JAUNDICE
- ENCEPHALOPATHY/CONFUSION
- FATIGUE AND NAUSEA
- MUSCLE WASTING
- ITCHING
- VARICES
- BLEEDING
- ASCITES



EVOLUTION OF TRANSPLANT

- 1963, UNIVERSITY OF COLORADO - ORTHOTOPIC LIVER TRANSPLANT (OLT) PATIENT LIVED FOR 23 DAYS
- 1963-82 - 466 LIVER TRANSPLANT PERFORMED WORLDWIDE (1 YEAR SURVIVAL RATES 30-50%)
 - BY 2007
15,000 TRANSPLANTS AT 8 CENTRES IN UK
5 YEAR SURVIVAL RATE 70-80%

LIVER TRANSPLANT WORK-UP

- 2-3 DAYS IN-PATIENT STAY
- HEART STUDIES
- ECG
- SEROLOGY
- MICROBIOLOGY
- CXR
- OPG

CONTRA-

INDICATION TO

- Extrahepatic Malignancy
- Extrahepatic Sepsis
- AIDS
- Severe Pulmonary Hypertension
- Active Substance Abuse
(Defined period of Abstinence)
- Consider Live Known

case study - PATRICK

- 53 year old male - sailor merchant navy
- Married 33 years - childhood sweetheart
- Father of 7
- 1997 diagnosed with HCV Ab
- Non drinker since 1990
- Risk Factors
 - Blood Transfusions 1981 and 89
 - Tattoos

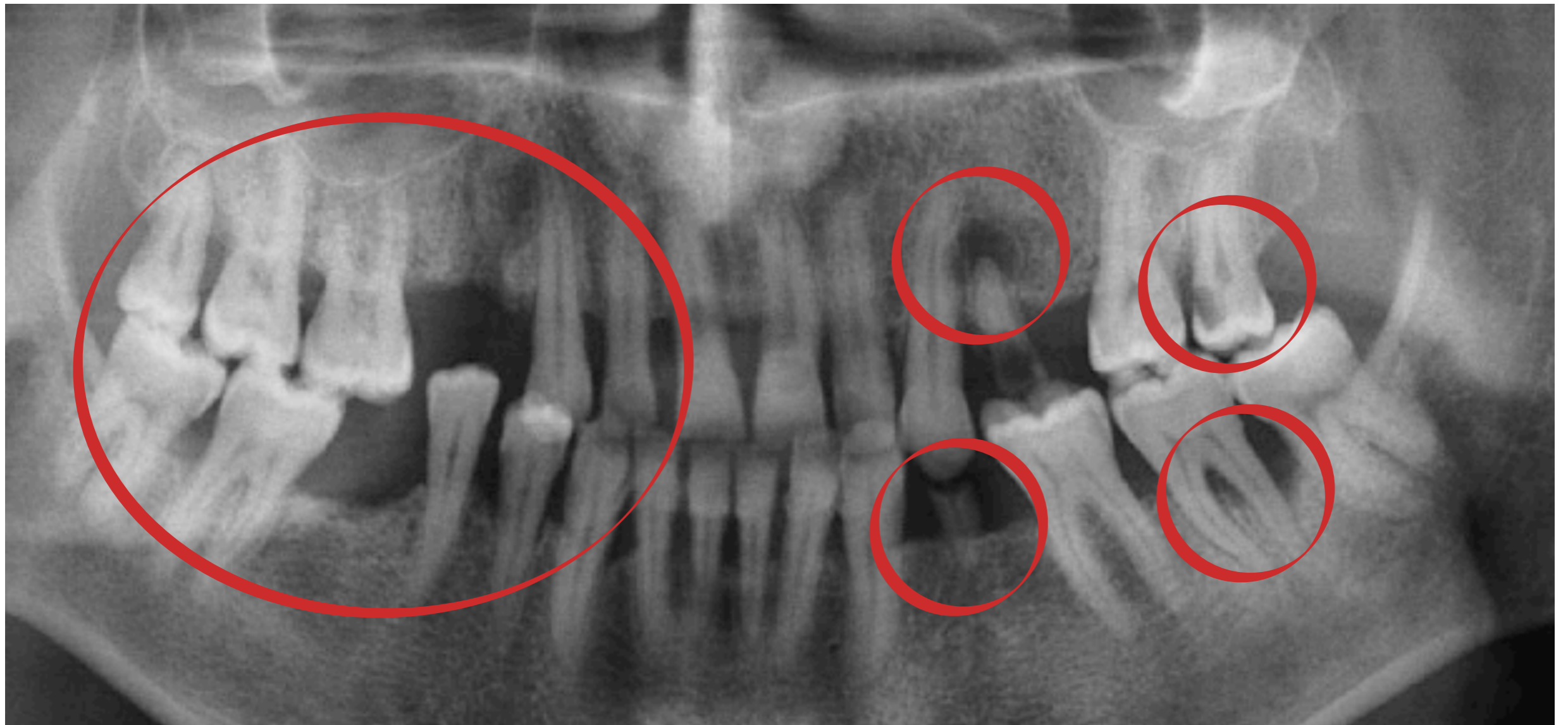
History

- 1981 - Jaundice
- 1997 - Liver Biopsy - hepatitis C and stage 4 fibrosis - commenced interferon treatment
- 1999 - Liver Biopsy - Cirrhosis (plan for yearly hepatoma surveillance)
- 2002 - Coughing blood (Grade I oesophageal varices),
- 2003 - U/S shows fatty liver, peptic ulcer, fatigue, itching
- 2005 - CT Liver - Multifocal Hepatocellular Carcinoma and cirrhosis

Endstage liver disease

- 2006 - proposed for OLT transplant
- 2006 - multi-disciplinary work-up
- OPG given to special care dentist to screen
- Extra-hepatic sepsis noted
- In-house Dental Consult arranged

PRE-TRANSPLANT



TREATMENT PROVIDED



- XLA 24 37 34
- MO 28 (VITAL NON SYMPTOMATIC)
- SCALING
- OHI
- CERVITEC ON BUCCAL CARIES

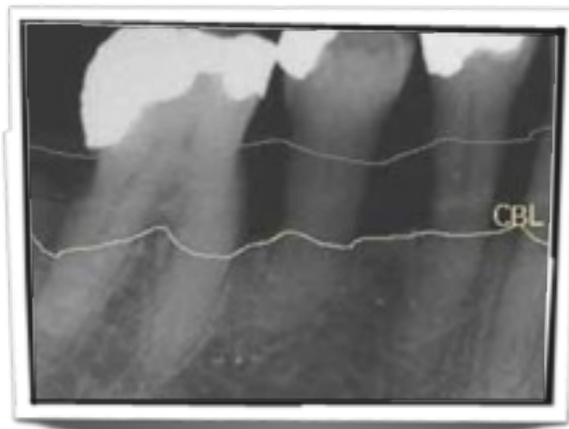
CLINICAL ISSUES

- PLATELETS 35×10^9 (platelets peri-op)
- INR 2.1 (LOCAL MEASURES)
- POST-OP ANTIBIOTICS
- 2 APPOINTMENTS LA
- NAUSEA/FATIGUE/DISCOMFORT
- CONFUSION/BEMUSED
- PASSIVE/CONSENT?

DILEMMAS



- 10 year outcomes +++
- No specific Guidelines
- Generic one size fits all conditions!!!
- Symptoms? Infection? Site?
- Type of microbe



QUALITY OF LIFE VERSUS RISK?

- **Untimely mental anguish**
- **Physical challenge ASA 4-5 Group**
- **Poor/Slow Wound Healing**
- **Often High Theoretical Treatment Need**
- **Previous Dental Neglect**
- **Lifestyle**
- **Difficulty in accessing Care**

TRANSPLANT - patrick

- LIVER MATCH FOUND 4 MONTHS LATER
- 7 HOUR OPERATION
- 2 DAYS ICU
- 3 DAYS START TO EAT
- 4 DAYS LATER SITTING UP LAUGHING IN LIVER WARD
- 10 DAYS LATER GOES HOME
- 3 MONTHS LATER WORKING PART-TIME!!

RISKS/ COMPLICATIONS

- 80% 5 year success rate
- ACUTE REJECTION/FAILURE = EARLY DEATH
- CHRONIC REJECTION/FAILURE = RE-TRANSPLANT
- RECURRENCE OF DAMAGE FROM ORIGINAL DISEASE
- ON-GOING IMMUNE SUPPRESSION/SIDE EFFECTS
- INCREASED RISK OF LYMPHOMA AND CANCER

POST-OP DENTAL

- Pre-Discharge preventive regime
- Pt in first phase of high immune suppression therapy
- Review 3 months post-transplant as day patient
- 3 months - immune suppression regime reduced to maintenance dose
- If patient is stable and bloods satisfactory

Prevention - born again!!!

- Pt at increased risk of dental problems
- Dental infection - candida/viral/ and peridontal disease
- Xerostomia
- Cyclosporin - gingival hyperplasia
- SCC and K. Sarcoma
- Prosthodontic replacement of missing dentition
- Patient usually euphoric and well motivated

Clinical notes

- 6 months post transplant
- Check with liver team for up to date bloods and liver function tests
- If transplant was successful no special measures required for bleeding
- No antibiotic prophylaxis prescribing issues or LA adjustment

Suggested Regime

- Reduced recall interval
- Fluoride - home and professionally applied
- Self-Examination instruction and regular screening of soft tissues
- Regular Hygienist input and OHI
- Fastidious denture hygiene
- Aggressive treatment of infections