

HEPATIC SURGERY

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ANATOMY

EVIDENSIA SPECIALISTDJURSJUKHUSET STRÖMSHOLM

- Majority of the liver lies on the right side of the median plane
- Four lobes, four sublobes and two processes
- Left lobe is the largest
- Quadrate lobe almost in the midline





• Loosely attached to surrounding structures by

- The caudal vena cava
- The coronary ligament
 - Large right-sided triangular ligament
 - Small right-sided triangular ligament
 - Left-sided triangular ligament
- The hepatorenal ligament
- The lesser omentum





- Vascular supply
 - Hepatic artery (20% of blood, 50% of oxygen)
 - Portal vein (80% of blood, 50% of oxygen)
 - Hepatic veins (6-8)







PREOPERATIVE CONSIDERATIONS



- Risk of life threatening hemorrhage
 - Coagulation profile, blood type, cross match
 - Preoperative treatment with fresh whole blood, fresh frozen plasma and vitamin K may be necessary
- Hypoglycemia
 - Small or debilitated patients
- Bacteria
 - Most common isolates in dogs *Clostridium perfringens*, *Staphylococcus spp*
 - Cats E.coli, Enterococcus spp, Bacteroides spp, Clostridium spp
- Anaethesia
 - Avoid halothane
 - Be prepared for mechanical ventilation

HEMOSTASIS IN HEPATIC SURGERY

- Capsular hemorrhage
 - Pressure
 - Surgical clips or staples
 - Vascular occlusion
 - Topical hemostatic agents
- Extensive hemorrhage
 - Vascular occlusion techniques







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Pringle manoeuver



- Occlusion of vascular inflow
- Total occlusion time must be less than 20 minutes
- Identify epiploic foramen
 - Caudal vena cava dorsally
 - Portal vein ventrally
 - Celiac artery caudally
 - Porta hepatis cranially
- Digitally compress hepatic artery and portal vein



LIVER BIOPSY



- Fine needle aspiration
- Cutting needle aspiration (Tru-Cut)
- Punch biopsy
- Wedge biopsy
- Suture fracture technique
- Harmonic scalpel, LigaSure
- Laparoscopic biopsy











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Punch biopsy

- Lesion located away from the periphery of the lobe
- Pieces of hemostatic sponge cut with same punch
- Punch inserted in the desired site
 - Do not penetrate more than half the thickness of the liver
- Biopsy is removed and plug of hemostatic sponge is inserted in the hole



Wedge biopsy

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- Only lesions at the periphery
- Cut a triangular biopsy from the edge
- Suture with a horisontal mattress
 - Do not overtighten just appose the edges
 - 0 to 2-0 polyglactin 910, polydioxanine, polyglyconate
- Alternatively preplace several overlapping guillotine sutures around margin of lesion









Suture fracture technique



- Only lesions at the periphery
- Place a crushing Kelley clamp across the tip of the lobe
- Place an encircling loop of suture proximal to the clamp
 - Monofilament absorbable suture
- Hepatic parenchyma distal to the suture is excised





PARTIAL HEPATIC LOBECTOMY

- Smaller more peripheral lesions
- Cases when liver hilum is not accessible
- Transect liver capsule
- Blunt dissection to identify larger vessels and bile ducts
 - Larger vessels/ducts ligated or sealed with vessel-sealing devices
 - Smaller vessels/ducts can be sealed with electrocautery or staples
- Surgical stapling devices may be used







COMPLETE HEPATIC LOBECTOMY



- Indicated in focal lesions involving 1-2 hepatic lobes
- Most lobes have a single lobar portal vein and a single lobar hepatic vein
- Left lobes maintain separation near hilus
 - In small dogs and cats an encircling ligature around the base of the lobe sufficient
- Right lateral and caudate lobes careful dissection around hepatic vena cava necessary



- Limits of acute hepatic resection unclear
- Staged resection makes larger resection possible
- Left lateral and medial lobes 44%
- Right lateral and caudate lobes 28%
- Right medial and quadrate lobes 28%
- Complications
 - Hemorrhage
 - Portal hypertension
 - Liver failure





- Left lobectomy small dogs and cats
 - Transect triangular ligaments
 - Crush parenchyma near hilus with finger or forceps
 - Pass an encircling ligature around the crushed area and tighten
 - Resect liver lobe distal to ligature







- Lobectomy of right, caudate or left lobes in larger dogs
 - Transect triangular ligaments
 - Carefully dissect the lobe from the vena cava
 - Isolate and ligate blood vessels and bile ducts near the hilus
 - Resect parenchyma distal to ligature
- Surgical stapling devices preferred over suturing if possible because of lower risk of ligature slipping







HEPATIC ABSCESSES AND CYSTS



- Uncommon in both dogs and cats
- Most common isolates
 - Dogs: E.coli, Staphylococcus spp, Enterococcus spp, Klebsiella spp
 - Cats: *E.coli*
- Cats mostly in the right liver lobes
- Dogs better prognosis than cats
- Combination of medical and surgical management





• Percutaneous drainage and alcoholization reported to be effective

(Zatelli A, Bonfanti U, Zini E: Percutaneous drainage and alcoholization of hepatic abscesses in five dogs and a cat. J Am Anim Hosp Assoc 41:34–38, 2005)

- Abscess aspirated percutaneuously under ultrasounded guidance
- 95% ethanol (half of aspirated volume) injected into the abscess and left for 3 minutes
- No reported complications
- Only one single treatment required

LIVER LOBE TORSION



- Uncommon disease
- Middle-aged to older large-breed dogs
- Usually left lateral lobe
- Surgical emergency
 - Lobectomy
 - +/- prophylactic gastropexy
- Prognosis excellent if treated promptly





HEPATIC TRAUMA



- Usually the result of blunt abdominal trauma
- Small capsular lacerations and parenchymal fractures often resolve spontaneously
- Aim of treatment
 - Control of hemorrhage
 - Debridment of devitalized tissue
- Omentalization



HEPATIC NEOPLASIAS



- 0.6-2.6% of all neoplasias involve the liver
- Primary hepatic neoplasms
 - 30% benign hepatocellular adenomas
 - 50-70% hepatocellular carcinomas
 - Other forms neuroendocrine carcinomas, mesenchymal tumours, mast cell tumours, histiocytic sarcoma
- Liver a common place for metastatic neoplasia





- Hepatocellular tumours
 - Metastasize to regional lymph nodes, lungs and peritoneum
 - Surgical resection treatment of choice if massive form
 - Favourable prognosis (MST >1460 days)
 - Poorer prognosis if situated in the right side of the liver
- Neuroendocrine tumours
 - Mainly intrahepatic in dogs, extrahepatic in cats
 - Metastazise to regional lymph node and peritoneum
 - Aggressive tumour with poor prognosis





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- Mesenchymal tumours
 - Dogs:
 - hemangiosarcoma, leiomyosarcoma, osteosarcoma, fibrosarcoma, mesenchymoma, chondrosarcoma
 - Cats:
 - hemangiosarcoma most common, leiomyosarcoma, rhabdomyosarcoma, osteosarcoma, fibrosarcoma
 - Surgical resection treatment of choice
 - Prognosis very guarded due to metastatic behaviour





- Mast cell tumours
 - Usually metastatic, but may be primary hepatic
 - Surgery useless
 - Medical management
 - Grave prognosis
- Histiocytic sarcoma
 - Focal or disseminated (malignant histiocytosis)
 - 41% of dogs have hepatic involvement
 - Medical managent
 - Poor prognosis



QUESTIONS?



