KASAI PROCEDURE – A CASE STUDY

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ABSTRACT

The Kasai procedure involves removing the blocked bile ducts and gallbladder and replacing them with a segment of the child's own small intestine. This segment of intestine is sewn to the liver and functions as a new extrahepatic bile duct system.

Either using an incision made below the ribs on the right of the abdomen or a laparoscopic technique, the bile ducts are first inspected. A study called a cholangiogram is performed to confirm the diagnosis of biliary atresia. To perform a cholangiogram, the surgeon places a small tube into the gallbladder, if present. Then they inject a medication that can help find the bile ducts using an X-ray machine.

If the gallbladder and bile ducts are not open and bile cannot drain, the child has biliary atresia. The surgeon will proceed to remove the very small or abnormal gallbladder and abnormal bile ducts where they connect with the liver. A piece of small intestine called the jejunum is then used to replace the bile ducts, making a connection between the liver and the intestine. This connection will hopefully re-establish bile drainage into the intestine, reversing the effects of the disease.

Key word - kasai procedure

INTRODUCTION

The standard surgical technique is the creation of a Roux-en-Y hepatic porto-enterostomy (Kasai procedure) in which excision of the fibrotic biliary remnant, transaction of the fibrous portal plate with dissection extending up to the bifurcation of the portal vein is done.

CASE PRESENTATION

HISTORY COLLECTION

PRESENT MEDICAL HISTORY

Baby. XX came with the complaints of abdominal distention and jaundiced past 6 month and edematous all over the body past 10 days umbilical hernia past 6 month and now he is dehydrated due to 19 episodes of loose stools per day Then, he underwent many investigation after diagnosed as Biliary atresia . Now he planned to undergo paediatric examination.

PAST MEDICAL HISTORY

He has previous history of cholestasis

PAST SURGICAL HISTORY

He has previous history of cholestasis and liver biopsy confirmed biliary atresia at 3 ½ month.

PRESENT SURGICAL HISTORY

Child underwent living donor liver transplantation for biliary atresia/ post kasai on 11/3/24.

DIETARY PATTERN: current diet breast milk and rice kanji, tender coconut water

SLEEP PATTERN: he has sleeping disturbances due to hospitalization.

ELIMINATION PATTERN: he has 19 episodes of loose stools past 5 days.

HYGENIC PATTERN: hygiene is good

SOCIAL –ECONOMIC HISTORY: He is from middle class family. He is having his own house with adequate water and electricity facilities with proper drainage. His father is breadwinner of their family and he is working as a salesman

MATERNAL HISTORY :

Antenatal problem - 7th month of pregnancy find out oligohydromias

Antenatal post perirectal - nil

BIRTH HISTORY

He is born under caesarean section at birth weight 3.5 kg. Apgar score -8. At birth he is yellowish only two days he is in phototherapy and 2 hours once strict breast feeding.

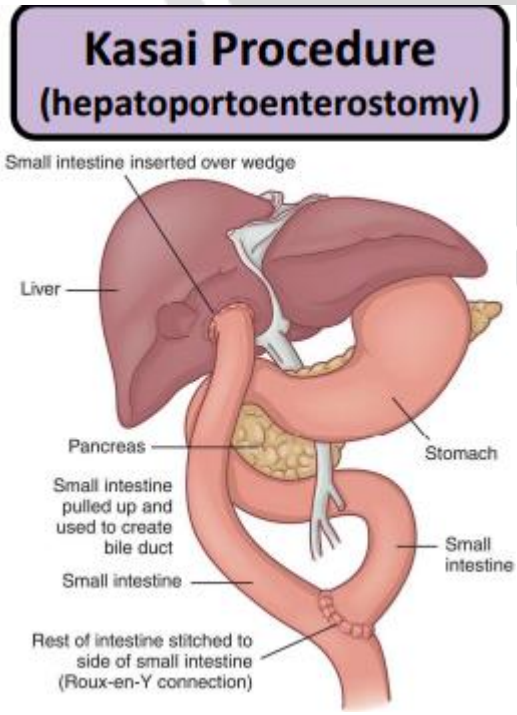
PHYSICAL EXAMINATION

Physical examination reveals icteric child, pale, oedematous, abdominal distension with umbilical hernia

INVESTIGATION OF THE PATIENT

Hemoglobin-9.7 gm/dl, Sr. Potassium - 5.02 mmol/dl, Sr.Chloride - 102 mmol/dl, Lactose -8.4mmol/l, Glucose -137mg/dl, Neutrophil -82%,

Lymphocyte - 81%, Monocyte - 9%



EXPLANT HEPATECTOMY

Abdomen entered through the previous kasai incision. Above findings noted. Self-retaining Thompson retractor applied. Dense bowel adhesions from the parietes released. Left lobe and caudate lobe dissected and mobilized. Left phrenic vein divided and transfixed. Right triangular ligament was divided. Small retro hepatic veins dissected and divided between prolene ligatures and clips. Roux loop skeletonized, loop and divided ligatures. RHA and left hepatic artery dissected and divided.

RHV and MHV-LHV dissected until the junction with the IVC. Hepatic venous confluence over IVC cleared off the peritoneum and fat for at least 1cm cranially. Retro hepatic space opened for cross clamping aorta.

Right and left branches of portal vein divided as far inside the liver tissue as possible. Adhesions between caudate and IVC divided. Infra hepatic IVC cross clamped and supra hepatic IVC cross- clamped above the hepatic venous confluence. Explant hepatectomy completed by dividing the hepatic veins into the liver parenchyma.

Two orifices of hepatic venous confluence joined by dividing the bridge horizontally. Cavotomy margins refreshed for anastomosis. Left lateral end of the cavotomy stitched for equalizing the triangle.

Explant removed. Small bleeders on the cava sutured with 6-0 prolene sutures. Haemostasis secured. IVC tested for any leaks by bleed and flushing. Portal vein deroofed by dividing the veins between right and left PV over a mixtard. PV margins freshened and flow checked.

Graft details left lateral segment graft. Graft weight-244g

GRWR-2.8,LHV, Single artery, single PV, two ducts in a cuff

IMPLANTATION

Graft liver was placed in the anatomical orthotopic position over the sponges soaked in cold UW solution after triangulation of the hepatic venous orifice by dividing the posterior edge in middle.

HEPATIC VEIN ANASTOMOSIS

Stay sutures taken on the base of the inverted triangle with 5-0 prolene from the graft and the recipient venous stumps (suture taken so as to equalize the three sides of the triangle). Suturing started from the tip of the inverted triangle with 5-0 prolene. Three bites taken on the graft and single bite on the IVC.

The graft was then rotated to the right to suture the left side of the anastomosis with continuous sutures and tied to the stay suture taken on the left corner of the base of the triangle. Graft was then rotated to the left to suture the right edge of the caval anastomosis and tied with the stay suture on the right corner. Base of the triangle was then sutured with interrupted 5-0 prolene stitches. Graft flushed with 250ml of cold saline before tying the last suture on the caval anastomosis.

PORTAL VEIN ANASTOMOSIS

Graft lifted and retracted to the left to approximate the recipient and donor portal veins. Stay suture taken on the left corner after opening the vein with the forceps inside the vein. Next stay suture taken on the right corner. Suturing started from the left corner on the posterior wall with 7-0 prolene. All sutures interrupted and knots outside. Right corner stitch shifted divided after the corner but one stitch and corner shifted to the anterior wall. Anterior wall sutures placed with stays. Portal vein bled gently after clamping the graft stump and then flushed before tying the last 3-4 stitches.

REPERFUSION

Supra hepatic venous clamp released followed by infra hepatic IVC clamp. Bleeding points from the IVC and anastomosis sutured with 6-0 prolene. Portal venous clamp released and slowly allowed to expand by pinching

gently between thumb and index finger. Patient's hemodynamic parameters are checked for the next 30-60 seconds. Graft felt slightly swollen.

HEPATIC ARTERY ANASTOMOSIS

Recipient hepatic artery (RHA) mobilized proximally for a tension free anastomosis and easy placement near the graft artery. Excess length of recipient artery excised using tenotomy scissors. Calibre and lie of the artery checked with the calibre of the graft artery. Artery bled to check the flow and bulldog clamp applied proximally. Artery flushed with saline. Bulldog clamp applied horizontally on the graft artery. Both arteries approximated.

Anastomosis started from the middle of the posterior wall with 8-0 prolene, double needle suture. Suture needle was passed inside out on both walls and shod applied and kept on the left. Next stitch was taken to the right of the previous stitch in a similar manner and tied. Serial stitches were placed on the right side followed by a stitch to the left of the first stay suture. Stay suture was then tied. Right corner stitch also taken with both needles inside out and held. Both the corner stitches shifted anteriorly. Anterior wall was sutured with single needle 8-0 prolene and held. Graft side bulldog clamp was then released before the last 2 stitches. Last stitch was taken with two needle, both traveling inside out. Recipient artery was flushed before tying the anterior wall stitches. Recipient artery clamped released and pulsation in the graft artery checked. Surgical placed on the anastomosis and surgical flushed with papaverine.

LHV – triphasic

Portal vein velocity – LPV-90-100cm/sec

Hepatic artery – 0.7RI

BILE DUCT ANASTOMOSIS

Golden yellow bile noted flowing from the graft duct. Haemostasis around the bile duct secured with prolene sutures. Unhealthy bowel at the distal end of roux loop excised using 55cm cutter and stapler and edge overseen with 5-0 PDS. Distal segment of roux loop approximated against the duct and enterotomy done with needle cautery tip. Pouting mucosa excised and mixtard clamp inserted and rotated to confirm the lumen. Anastomosis started from the left end of the duct with 7-0 PDS.

Doppler repeated and the findings were similar to the previous Doppler. Subcutaneous tissue was closed with 4-0vieryl continuous sutures and skin edges were approximated using 4-0 monocrvl sutures. Graft weight-244gm, GRWR-2.8,Cold ischemia time – 92 mins, warm ischemia time -360 min, blood loss- 350ml, transfusion -350ml PRC, 50ml FFP,50ml cryo, crystalloisds – 500ml, colloids- 500ml

Child was shifted to liver transplant ICU for post operative care. Post operatively mechanical ventilation was continued overnight and child was extubated on POD-1. Child was received off inotropic support. On POD-2 child had wheeze treated with levolin and ipravent nebulization. Child had abdominal drains POD -4 his drain output was minimal and clear and drain was removed.

CONCLUSION:

Biliary atresia is an obstructive cholangiopathy of unknown etiology involving both the intrahepatic and extra hepatic bile ducts. It presents in the neonatal period with persistent jaundice, clay-colored stools, and hepatomegaly. The most common complication with Kasai portoenterostomy is ascending cholangitis and recurrent ascending cholangitis, but portal hypertensive complications, intestinal obstruction, sepsis, and liver failure are also possible.

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