NHS
Blood and Transplant

Clinical Session:Donor Assessment

Stephen Masson
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Caring Expert Quality

LDLT Donor work up Liver anatomy and radiology assessment and quality

- Satheesh Iype
- Beverley Kok
- Emma Harkin
- Joerg-Matthias Pollok

Donor Details

- MM (Mother) (53)
- BG O+, weight 67kg, height 154cm, BMI 27

- PMHx- nil Hx, takes HRT post menopause
- Swims 3 times weekly
- Family Hx – Sister has T2DM
- Routine cervical screening 2020 & mammogram 2021
- Social – Works in HR for a US based company
- Alcohol – 5 rums per week – stopped since live donation process started 4/12 ago, non smoker, no illicit drug use

Donor step 2 – initial ax

- Initial blood work:

Confirmatory BG : O+

FBC - Normal

U&E- Normal

LFTs - Normal

Clotting - Normal

Hb	135
Platelet count	260
INR	1
APTT	29.5
Fibrinogen	3.4
Na	144
K	4.4
Cr	74

Bb	4
ALT	16
AST	19
ALP	54
Alb	48
AFP	1.4
CA19.9	13.9
CEA	2

Donor step 3 – Psychological assessment

- Nil psychiatry history
- Married with 2 children aged 23 & 26
- Good relationship with recipient
- Shows good understanding of risks involved with surgery, hospital stay etc – well informed
- Nothing to preclude her from being a live donor for her son
- Social worker review :
- Can take paid time off work – company very understanding

US Doppler liver & portal system

- The liver parenchyma appears generally mildly echogenic, which may indicate mild hepatic steatosis. The known small (5 mm) simple cyst in the left lobe of liver is unchanged in size. No other obvious liver lesions or ductal dilatation seen. Antegrade flow of the portal vein with normal velocity measuring 29 cm/sec. The hepatic artery RI is normal measuring 0.64. Patent Doppler waveform of the hepatic veins.
- The gallbladder appears thin walled and stone free. The CBD is of normal calibre measuring 3.9 mm.
- The known pancreatic body simple cyst measures 6 mm - unchanged in size. Pancreas appears otherwise unremarkable.
- The abdominal aorta, spleen (105 mm) and both kidneys appear grossly normal. Both kidneys measure approximately 112 mm in bipolar length.
- Impression:
- Mild hepatic steatosis. Known small left lobe of liver simple cyst. No other obvious liver lesions. Patent liver vasculature.
- Known stable pancreatic simple cyst.

Step 4 – Imaging

CT 4/11/22

The liver has a smooth contour. There is a 6 mm simple cyst in segment II.

There is a replaced right hepatic artery arising from the SMA. Patent portal and hepatic veins with conventional anatomy.

There is a 5 mm unilocular thin-walled cyst in the body of the pancreas. The pancreatic duct is not dilated.

No definite abnormality demonstrated within the unprepared small and large bowel.

Mild degenerative changes are present in the thoracolumbar spine

Opinion: Replaced right hepatic artery arising from the SMA. 5 mm side branch IPMN in the body of the pancreas.

Total liver volume = 1168, segments 1-4 = 437.

FLR – 37%, GRWR – 0.99

Fibroscan

- **Fibroscan Result**
- *Liver Median Stiffness :* 4.4 KPa
- (Comment: CAP: 233 Probe M)
- *IQR/Med :* 16 %
- *Success Rate :* 100 %

MRCP 14/12/22

The liver has a smooth contour.

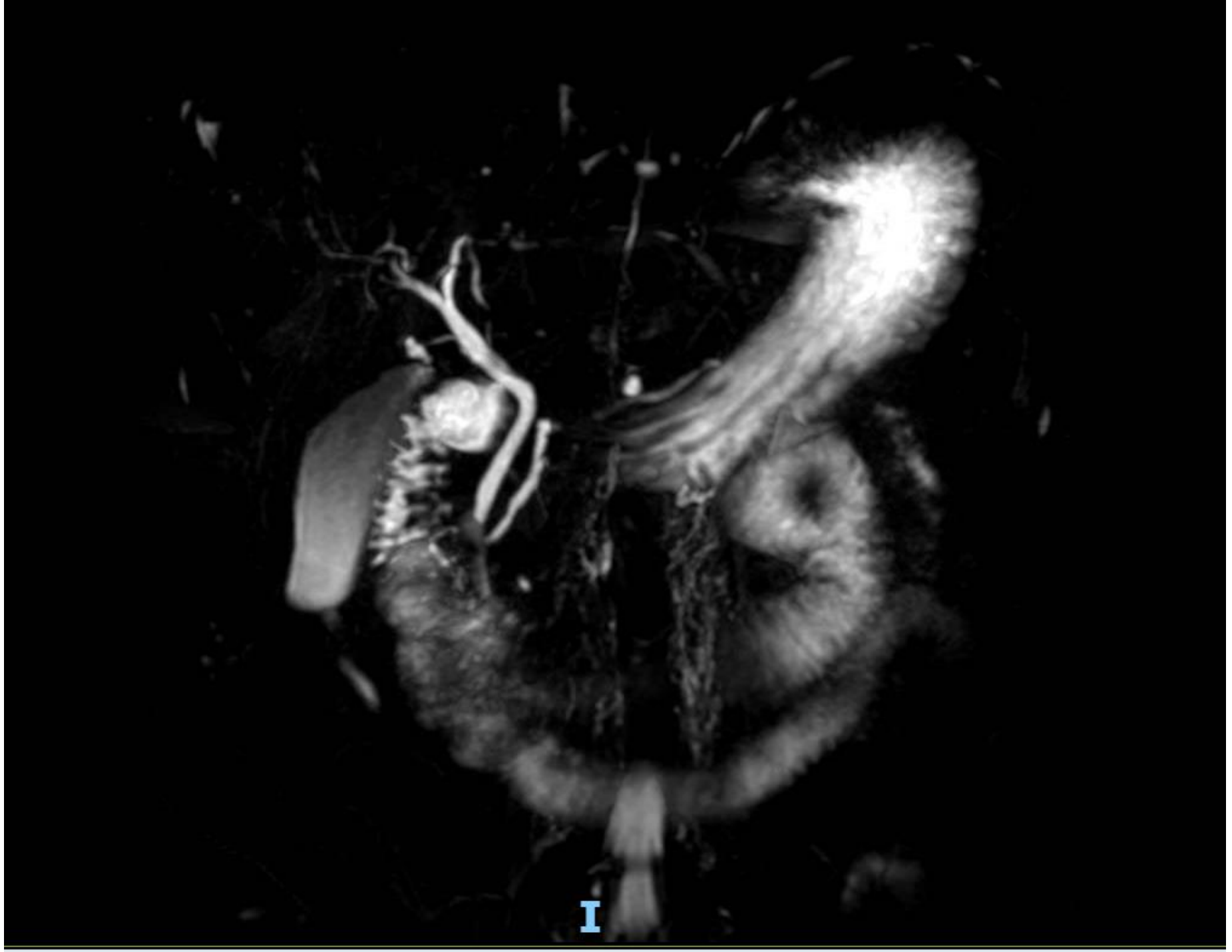
There is a 7 mm and hepatic cyst in segment II.

There is no biliary dilatation, stricturing or intraductal filling defects. Conventional biliary anatomy.

There is a simple 6 mm unilocular cyst arising from the pancreatic body demonstrating communication with the main pancreatic duct, which is not dilated.

Opinion: Conventional biliary anatomy. 6-mm pancreatic side branch IPMN.

MRCP



MRPDFF

There is an addendum added to the end of this report

ADDENDUM CREATED BY: Joshua Bell, Consultant Radiologist, GMC7271130 ON 27/02/2023 14:04

Clinical indication

potential right lobe donor, for MRI Live donor protocol, for MRCP and fat estimation please. discussed with DR Laverty and Mr Crabtree

Report Body

The right anterior and posterior ducts join conventionally to form the right hepatic duct. There is a small duct which is presumed to drain the caudate lobe which inserts onto the right hepatic duct 5 mm above the right hepatic/left hepatic duct confluence. The segment 4 duct drains into the left hepatic duct approximately 10 mm above the duct confluence.

The estimated liver fat fraction is 12.2%.

Tiny haemangioma in segment 3 along with a couple of subcentimetre cysts. 8 mm likely side ' branch IPMN arising from the pancreatic body. No other significant findings.

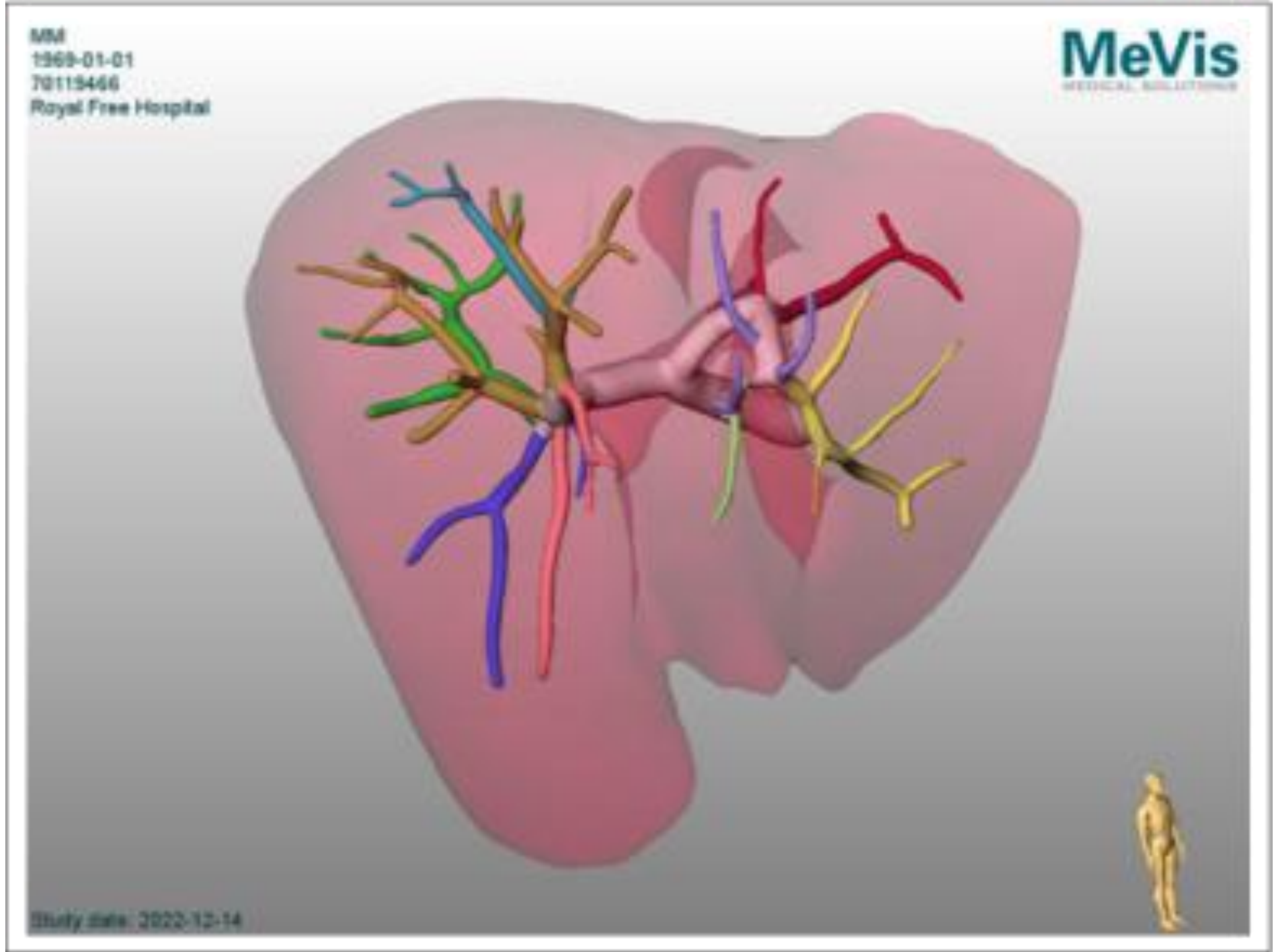
Double reported by Dr Albazaz and Dr Kaye (Cons Rads)

Re-reviewing the fat quantification the 12.2% estimate from spectroscopy is almost certainly an artefact. The liver does not appear steatotic on either in/opp phase or dixon images. The q-dixon fat estimate for an ROI in the right lobe is 0.9%

Addendum by: Joshua Bell, Consultant Radiologist, GMC7271130
Created Date: 27/02/2023 14:04
Verified Date 27/02/2023 14:11 Status: Validated

Reported by: Raneem Albazaz, Consultant Radiologist, GMC6101152,Thomas Kaye, Consultant Radiologist, GMC7016039 27/02/2023 13:07
27/02/2023 13:38
Verified by: Thomas Kaye, Consultant Radiologist, GMC7016039
Status: Validated

~ End of Report ~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MeVis
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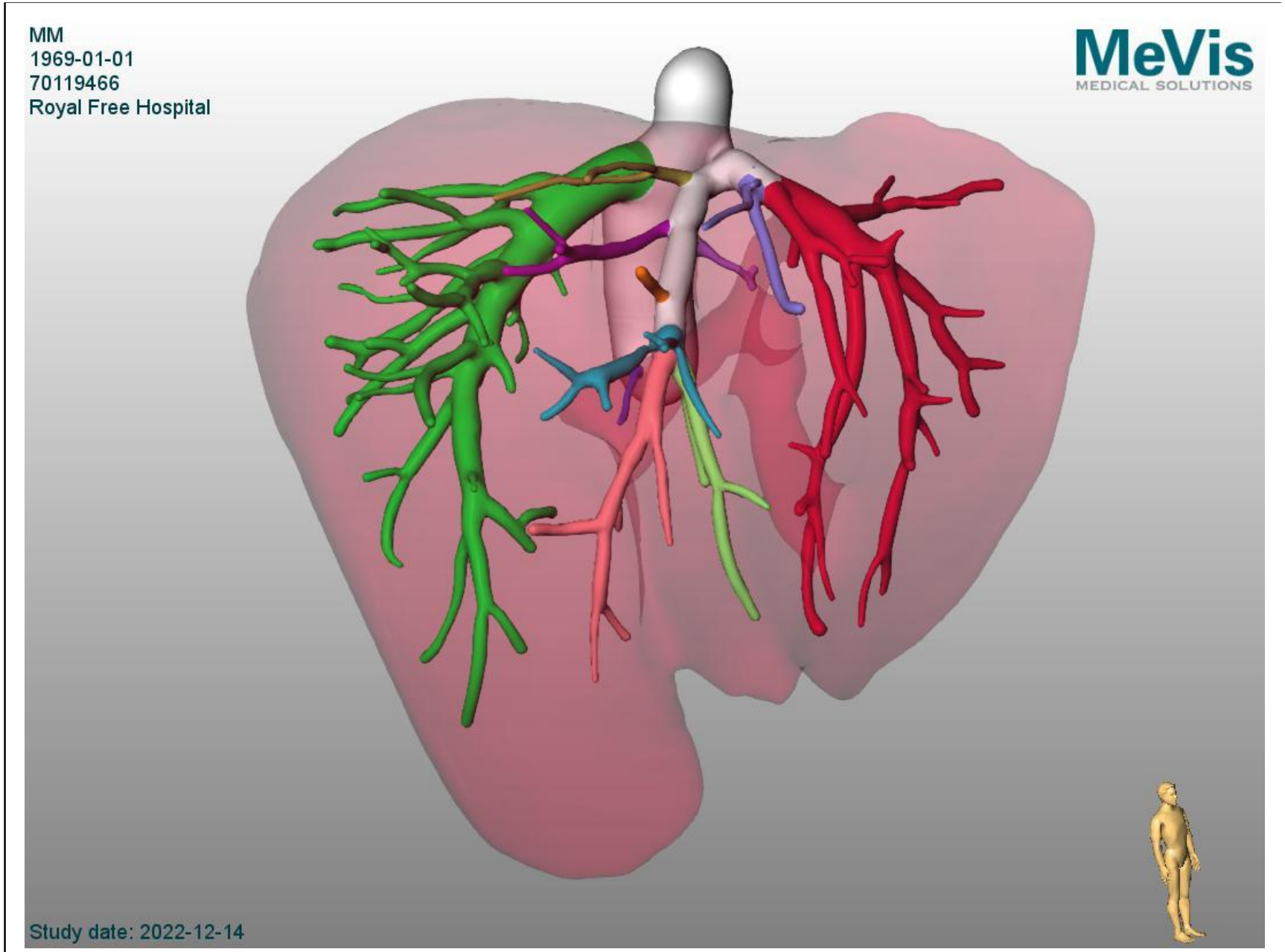

HV Anatomy

HV Territories (Volumes)

	Territory	Volume	Relative (%)
	HV1	28 ml	2.3
	inf.HV	18 ml	1.5
	LHV	257 ml	21.1
	LV4a	56 ml	4.6
	MV4a_8	87 ml	7.2
	MV4b	55 ml	4.5
	MV4b_5	92 ml	7.6
	MV8i	13 ml	1.1
	MV8m	64 ml	5.2
	MV8s	47 ml	3.9
	RHV	499 ml	41.1
	Total	1216 ml	100.0

Minimal deviations can be caused by rounding errors.

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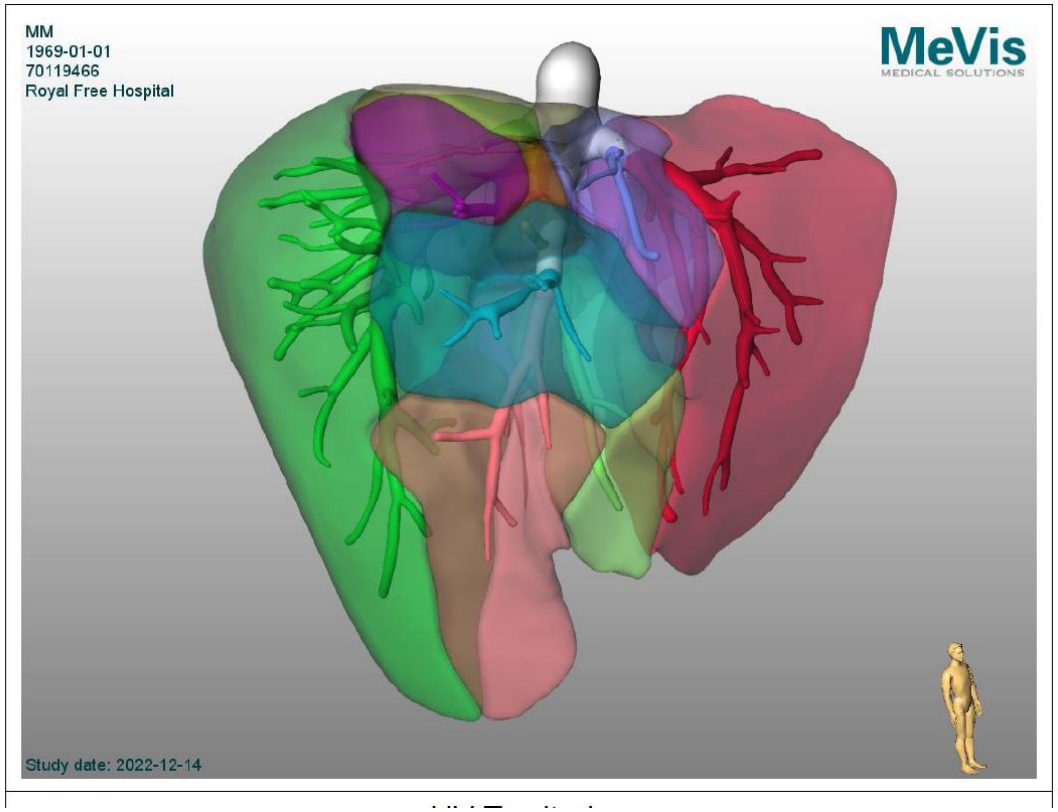
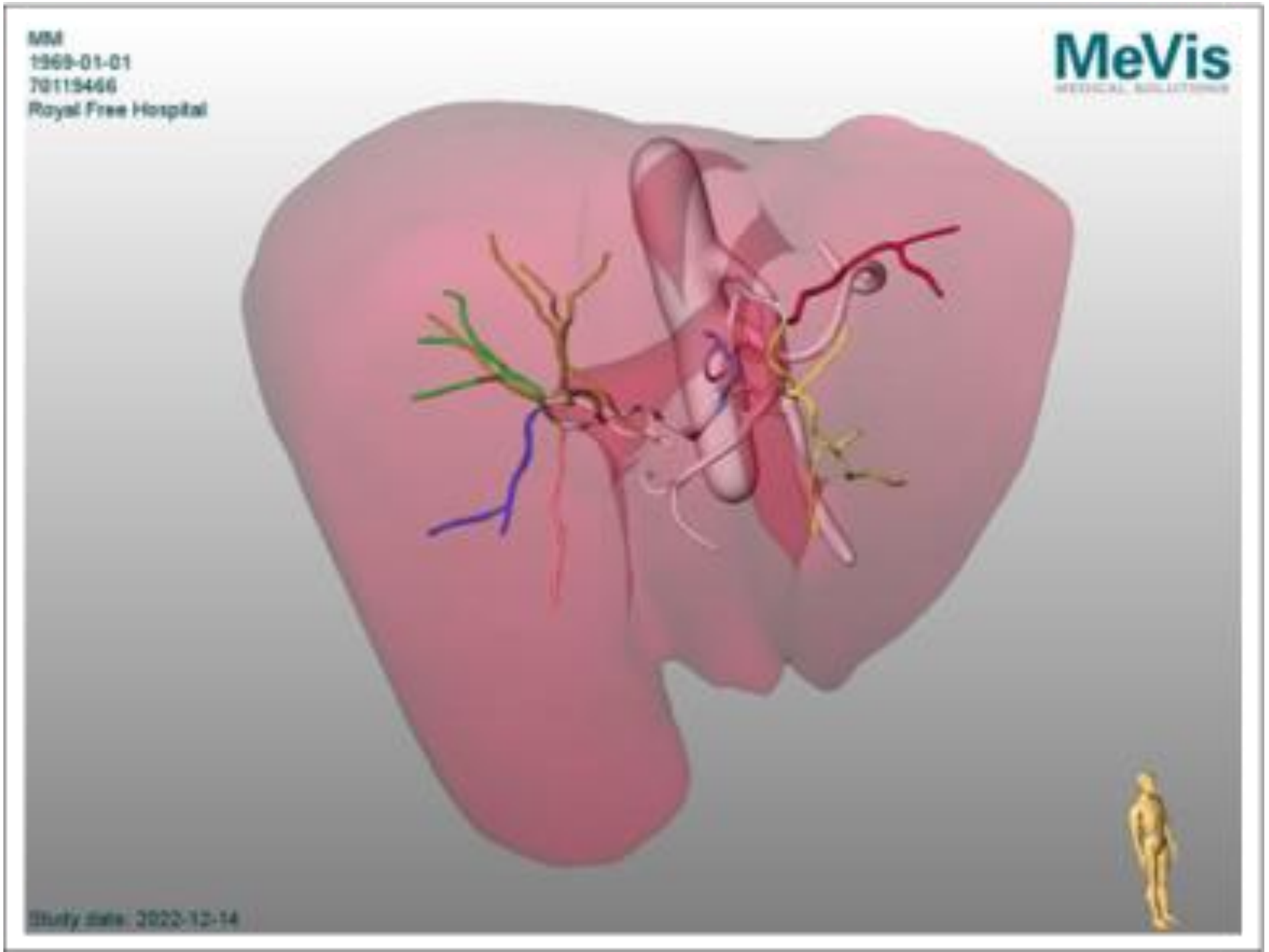


HA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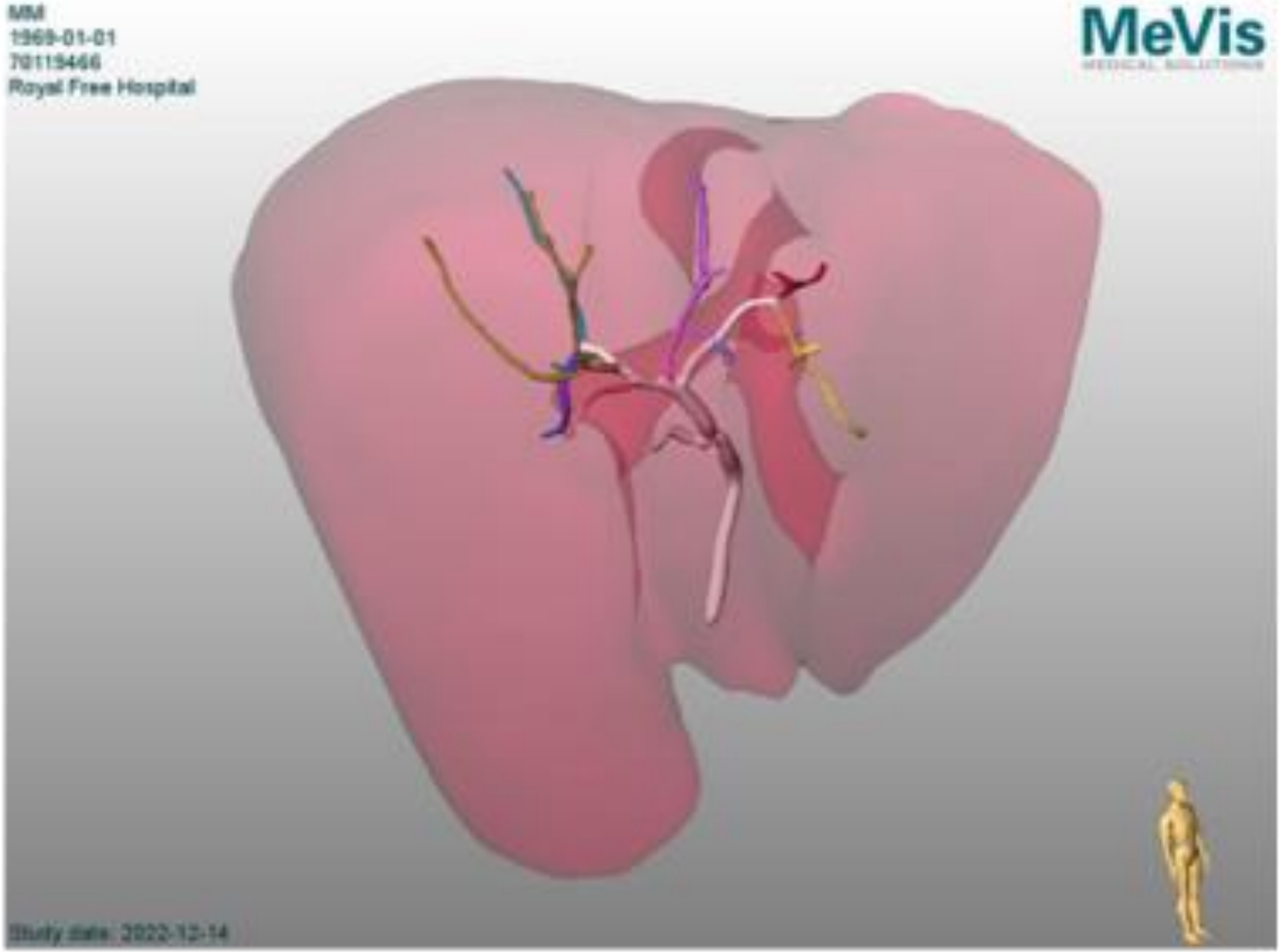
BD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3.1 Plane1, Right Lobe Graft without MHV

Plane1, Right Lobe Graft without MHV (Volumes)

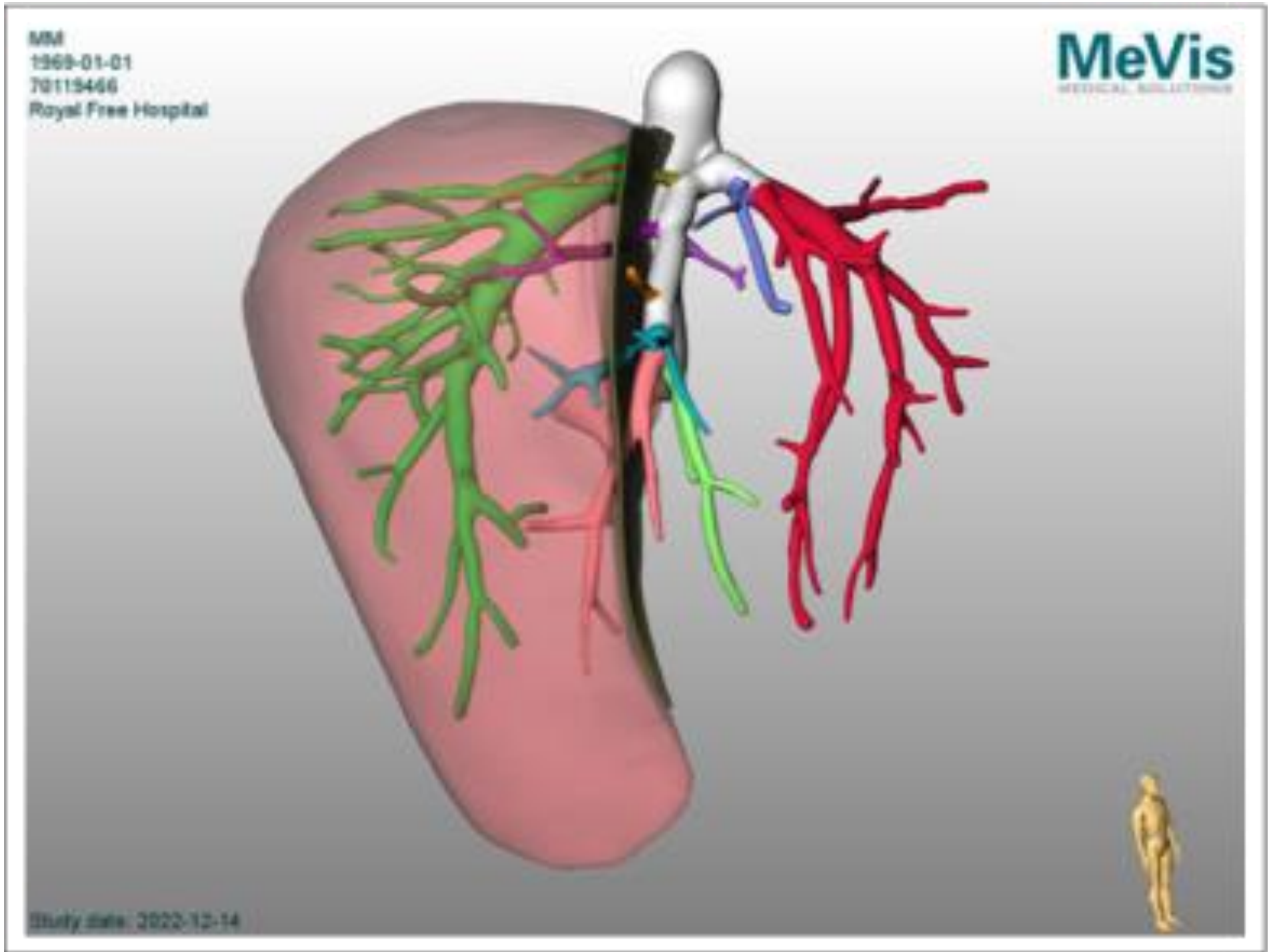
	Territory	Volume	Relative (%)
	Plane	17 ml	1.4
	Graft	723 ml	59.5
	Remnant	476 ml	39.2
	Total	1216 ml	100.0

Minimal deviations can be caused by rounding errors.

The estimated graft weight is about 658 g.

Key figures

Ratio	Based On	Value
Graft Recipient Body Weight Ratio	Estimated Graft Weight	0.88
Graft Recipient Body Weight Ratio	Graft Volume	0.97
Graft to SLV Ratio	Estimated Graft Weight	0.50
Graft to SLV Ratio	Graft Volume	0.55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3.2 Plane2, Right Lobe Graft with MHV

Plane2, Right Lobe Graft with MHV (Volumes)

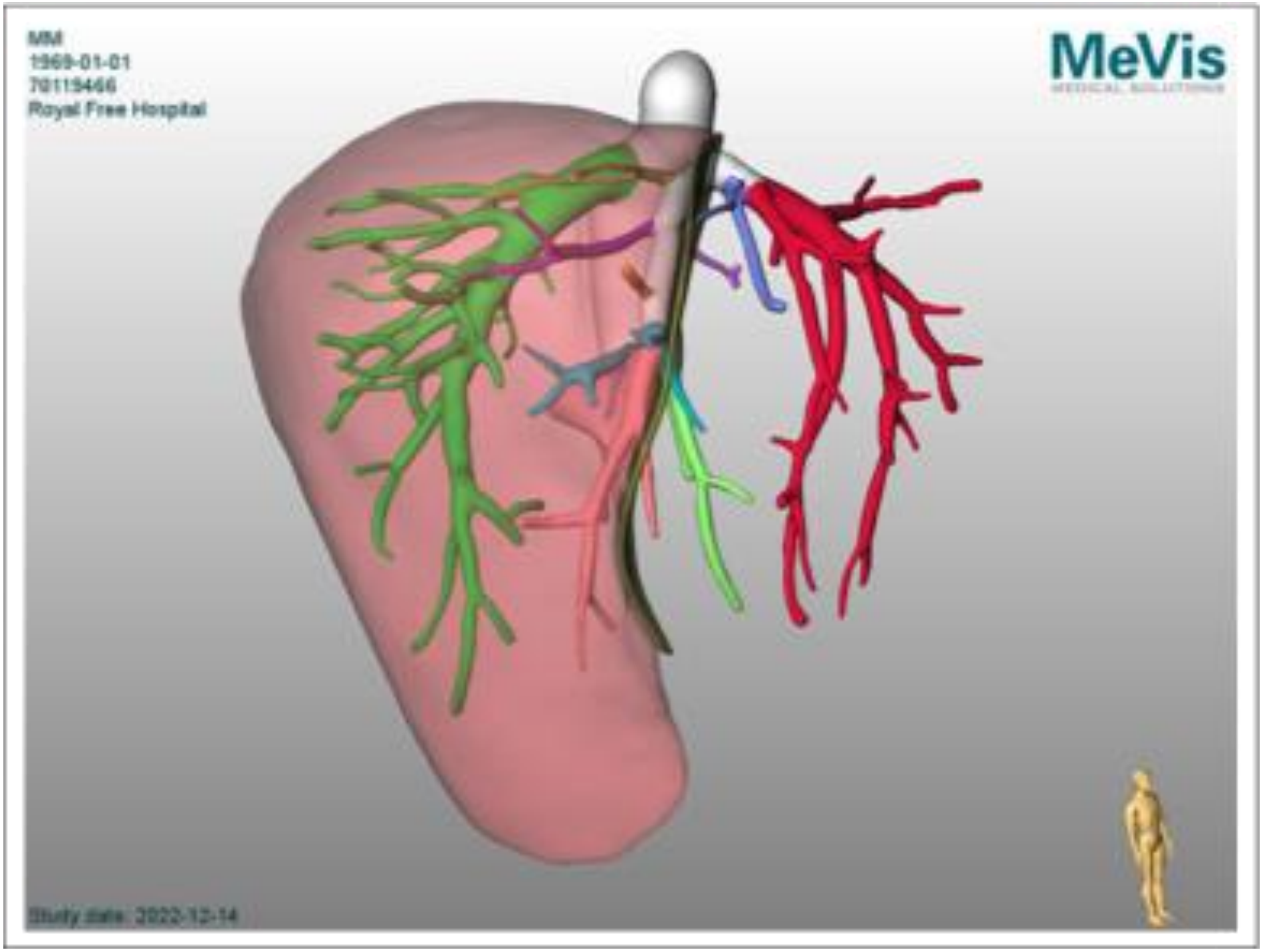
	Territory	Volume	Relative (%)
	Plane	16 ml	1.3
	Graft	783 ml	64.4
	Remnant	417 ml	34.3
	Total	1216 ml	100.0

Minimal deviations can be caused by rounding errors.

The estimated graft weight is about 713 g.

Key figures

Ratio	Based On	Value
Graft Recipient Body Weight Ratio	Estimated Graft Weight	0.96
Graft Recipient Body Weight Ratio	Graft Volume	1.05
Graft to SLV Ratio	Estimated Graft Weight	0.54
Graft to SLV Ratio	Graft Volume	0.60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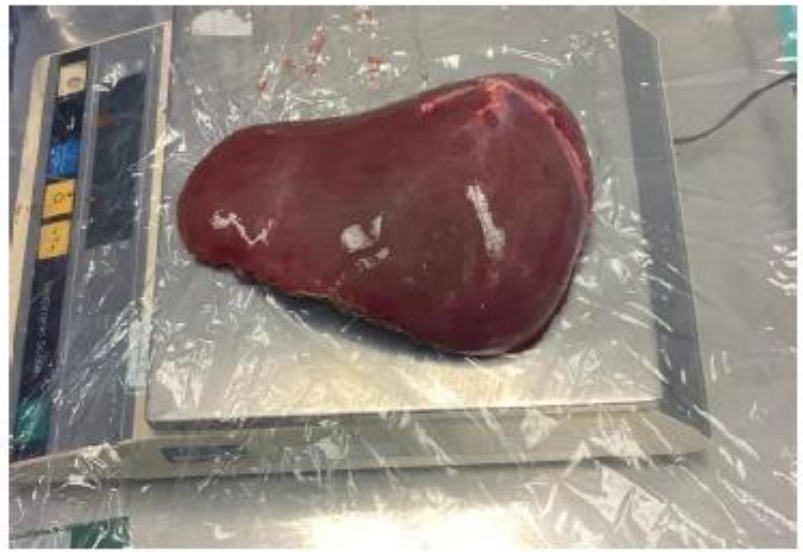
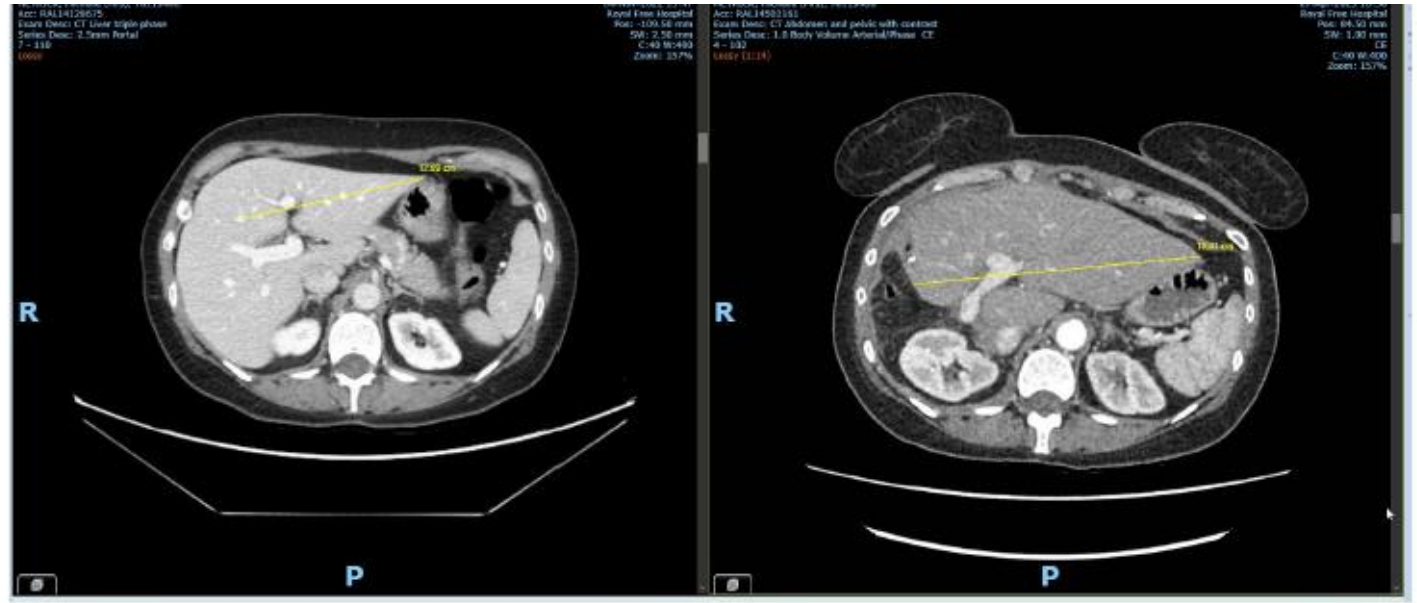
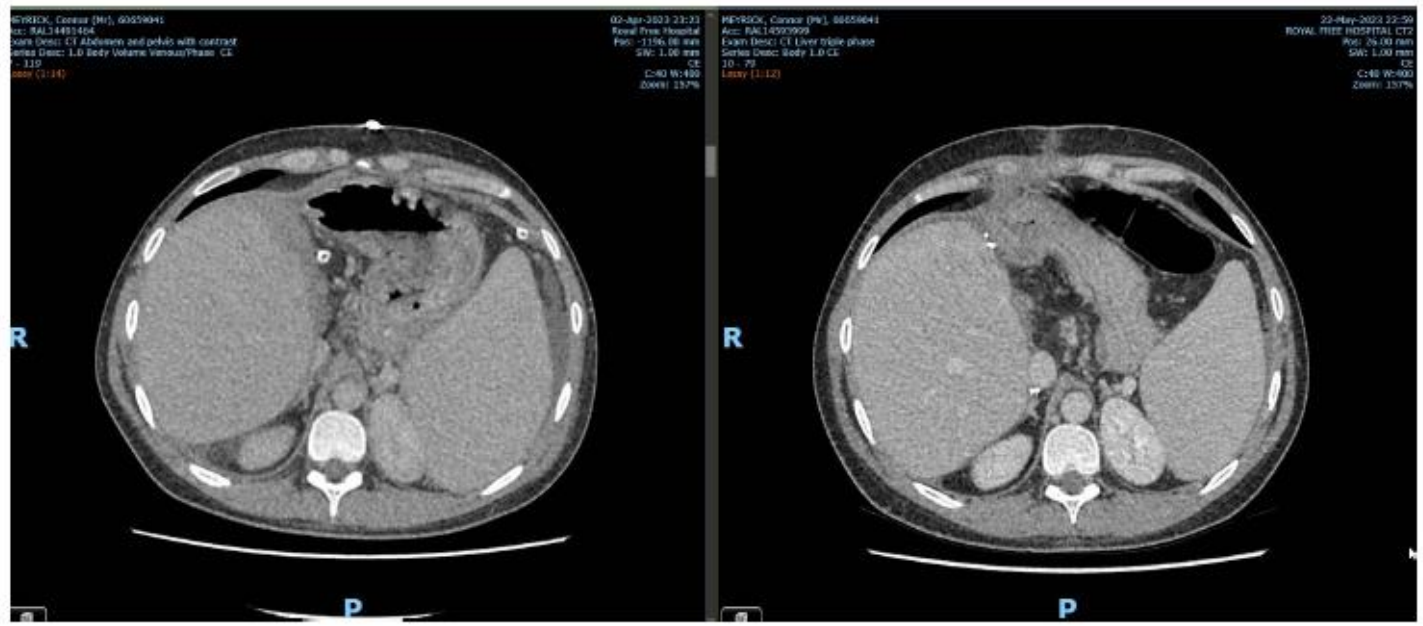


Donor



Recipient



Case 2

NHS Blood and Transplant

Potential Recipient

- 55yo female. ARLD cirrhosis (biopsy proven). Abstinent since presenting with alcohol-related hepatitis 2 years ago
- Type 2 Diabetes Mellitus, Obese (BMI 35); Cleaner: off sick
- Poor cardiorespiratory reserve (AT 8.4ml/kg/min) at initial assessment – enrolled in prehabilitation. Improves significantly (AT 12.5ml/kg/min)
- MELD 21; UKELD 59 (BR 170, Alb 28, PT 19)
- Registered on elective LT waiting list

Case 2

NHS Blood and Transplant

Potential Donor

- 21yo son - has been attending clinic with mum for 2 yrs – worried about her. Youngest of 6 siblings
- Unemployed, “setting up own business”

Donor	Recipient
Age: 21	Age:55
Son	Mother
Blood group: A	Blood group: A
BMI: 24	BMI: 35
Ht 1.72m, Wt 73kg	Ht 1.53m, Wt 83kg

Case 2

NHS
Blood and Transplant

Question:

Are you happy to proceed with further living donor work-up?

Case 2

NHS Blood and Transplant

Potential Recipient (21yo Son)

- Health check questionnaire
  - Asthma (Salbutamol inhaler); Smokes 5-10 cpd, Occasional alcohol; Previous cannabis
  - Lives with flatmate
- At initial clinic evaluation
  - OCD (Sertraline); Previously assessed/treated for ADHD
  - Never really had job; not clear on plans for future
  - **Adamant wants to donate and help mum**
  - Normal FBC, UE, LFT, Coagulation, Viral serology
  - Ultrasound: The liver is of normal size and echotexture. Normal directional PV, HV waveforms. Normal bile duct, GB, pancreas both kidneys and spleen. No free fluid.

Case 2

NHS
Blood and Transplant

Question:

How would you proceed?

Case 2

NHS Blood and Transplant

Psychosocial assessment

- General
  - Broke-up with girlfriend 6 months ago
  - Previous binge drinker
- Cannabis-related psychosis (aged 15)
  - Attended young-people's unit as a day patient for 2 months
- Paracetamol overdose (aged 16)
  - Depression around this time; Treated with Fluoxetine
- Self-harm
  - Scratching finished by aged 18
- ADHD
  - Previous treatment with Methylphenidate whilst at school
- Family history
  - Alcoholism (mother and father); no other mental health
- **<u>Good mental health since 18</u>**

Case 2

NHS
Blood and Transplant

Question:

What would you do next?

Case 2

NHS Blood and Transplant

Subsequently…

Potential donor

- 3 years later: Radical orchidectomy – Seminoma pT1
- Well, 9 years later. Completed degree. No further mental health issues.

Potential recipient

- Deceased donor DBD LT – complicated by chronic wound sinus and PTDM
- Cervical cancer – radical radiotherapy
- Alive and well, 12 years later

The Leeds Teaching Hospitals NHS
NHS Trust

Enhanced Donor Assessments

Dr Krishna Rao

Leeds Liver Unit

Case1

- Just turned 51, male
- Fit and well, working full time as an accountant with excellent exercise tolerance, NO SOBE,
- Vital parameters Normal range
- Non smoker since a teenager,
- no medications on record,
- BMI 26.5
- No relevant family history

RECIPIENT
Sick child on the deceased donor waitlist

Routine Evaluation

Routine FBC, Biochemistry , virology screening, immunoglobulin screening all within normal limits

Slightly Elevated Ferritin [457]

ECG: LBBB

Chest Xray:
Heart size normal with normal lung fields

How will you proceed?

Further Evaluation

- Hemochromatosis workup: Negative

- ECHO: Dilated LV, with marked hypokinesia and globally reduced contractions EF35%

Case 2

35/F BMI 22.8, previously run a marathon, 10 months postpartum.

Health Questionnaire no significant medical /family /psychosocial history

Pregnancy complicated by PIH and unplanned LSCS but uneventful recovery thereafter.

FBC/Biochemistry/virology/IECG/CXray
Within normal limits.

ANA screen/immunoglobulin levels all ok

Recipient : son born with biliary atresia on the pediatric list [for LLS]

TSH 52

How to proceed?

Further Evaluation..

Endocrine review: TTG/TPO/ free T3/T4

Treatment with Thyroxine initiated with good result

waited till free T4 within normal range and decreasing TSH before surgery.

Uneventful surgery and further post-operative course.

Mother and son doing well.