Glissonean approach and parenchymal dissection with water jet scalpel for liver transplantation living donor

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Preface:

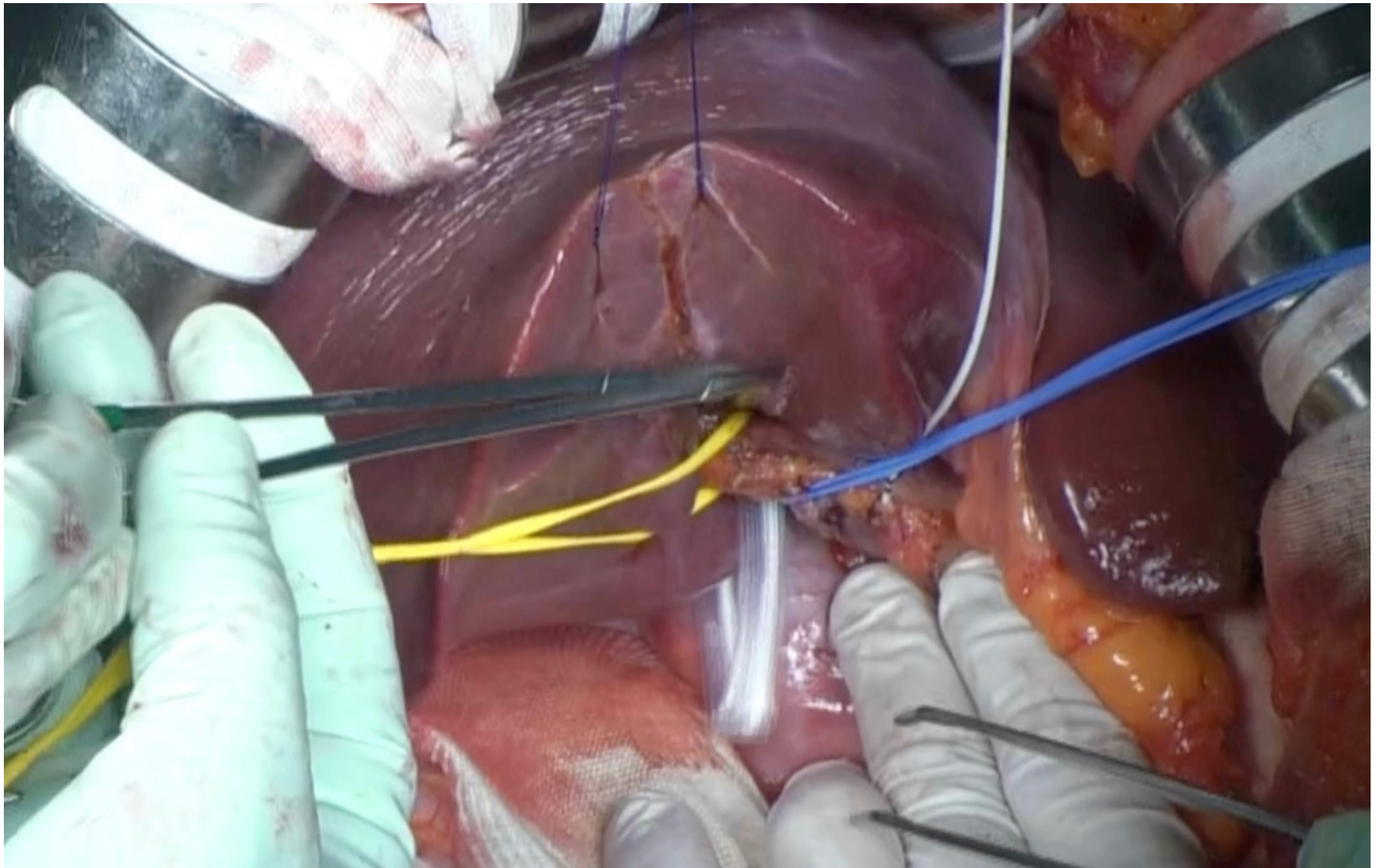
- Donor hepatectomy
  - appropriate margins for both blood vessels and bile ducts
  - blood supply around the bile
  - bleeding should be minimized
  - cauterization for hemostasis must be minimized

- Introduction of a new procedure and equipment
  - Glissonean approach for dissection around the hepatic hilum
  - ERBEJET® 2 water jet scalpel for parenchymal dissection

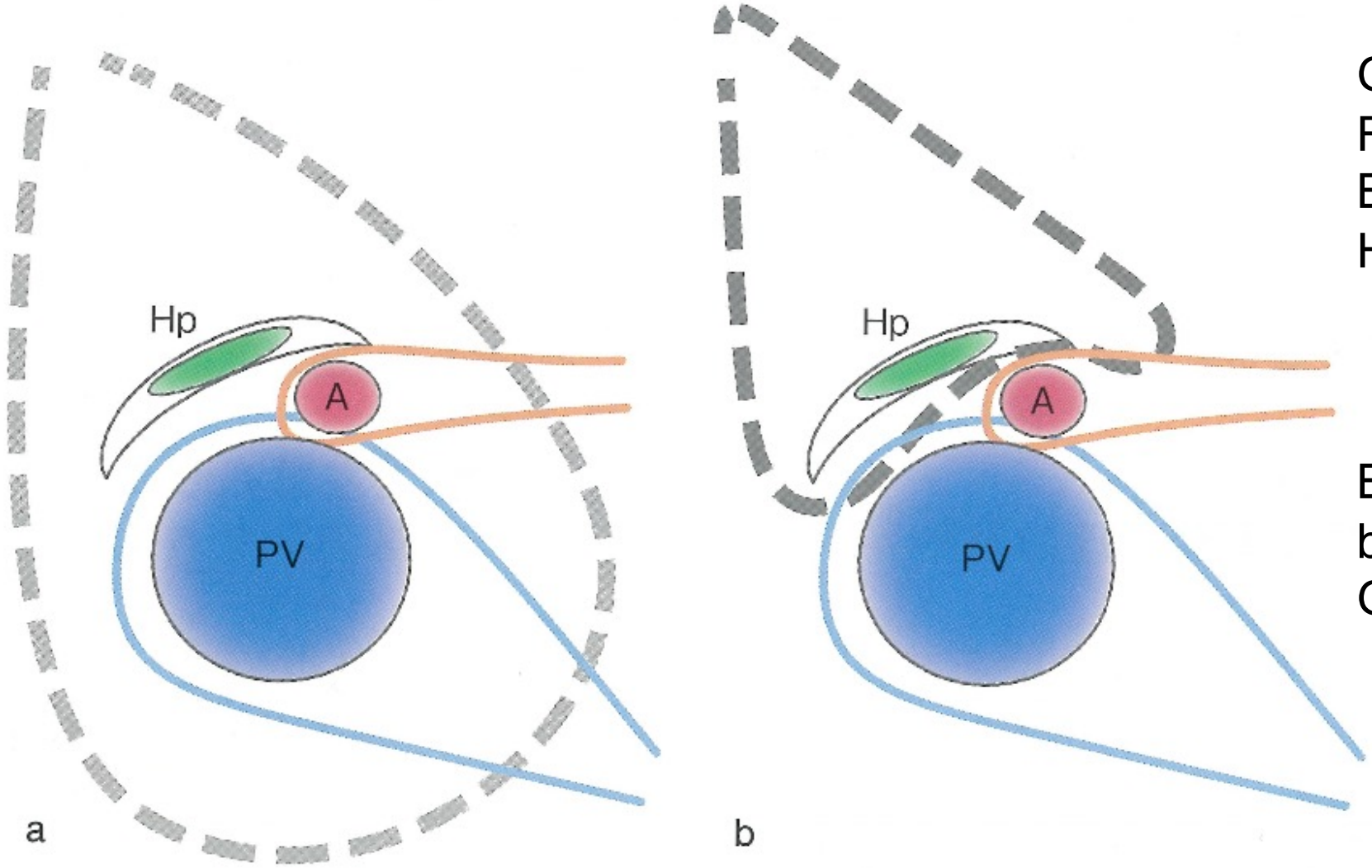
Methods:

- (1) laparotomy is performed via an inverted-T incision
- (2) the right lobe is mobilized to the inferior vena cava
- (3) a whole layer cholecystectomy is performed to clarify important details for the approach to the right Glissonean pedicle, which is encircled with rubber tape
- (4) The demarcation line on the liver surface is then delineated by temporary clamping of the right pedicle to provide a line for dissection
- (5) Using the tape around the Glissonean pedicle as a guide, a Penrose drain is passed between the pedicle and hepatic parenchyma. Dissection plain is clarified with the middle hepatic vein used as an indicator in the liver, and the Penrose drain to indicate the posterior surface as well as the cutting line to follow
- (6) The hepatic parenchyma is dissected with water jet scalpel, bipolar cautery to cauterize small vessels and scissors to cut cauterized structure
- (7) the RHA and RPV are then subtracted from the pedicle, leaving only the RBD remaining taped. Cholangiography is used determine the root of the RHD, which is severed accordingly
- (8) each vessel is dissected, then the grafted liver portion is removed from the donor
- (9) the ducts are closed, and hemostasis is confirmed, after which the wound is closed with no drain.

Step 5: subtraction



Vascular subtraction

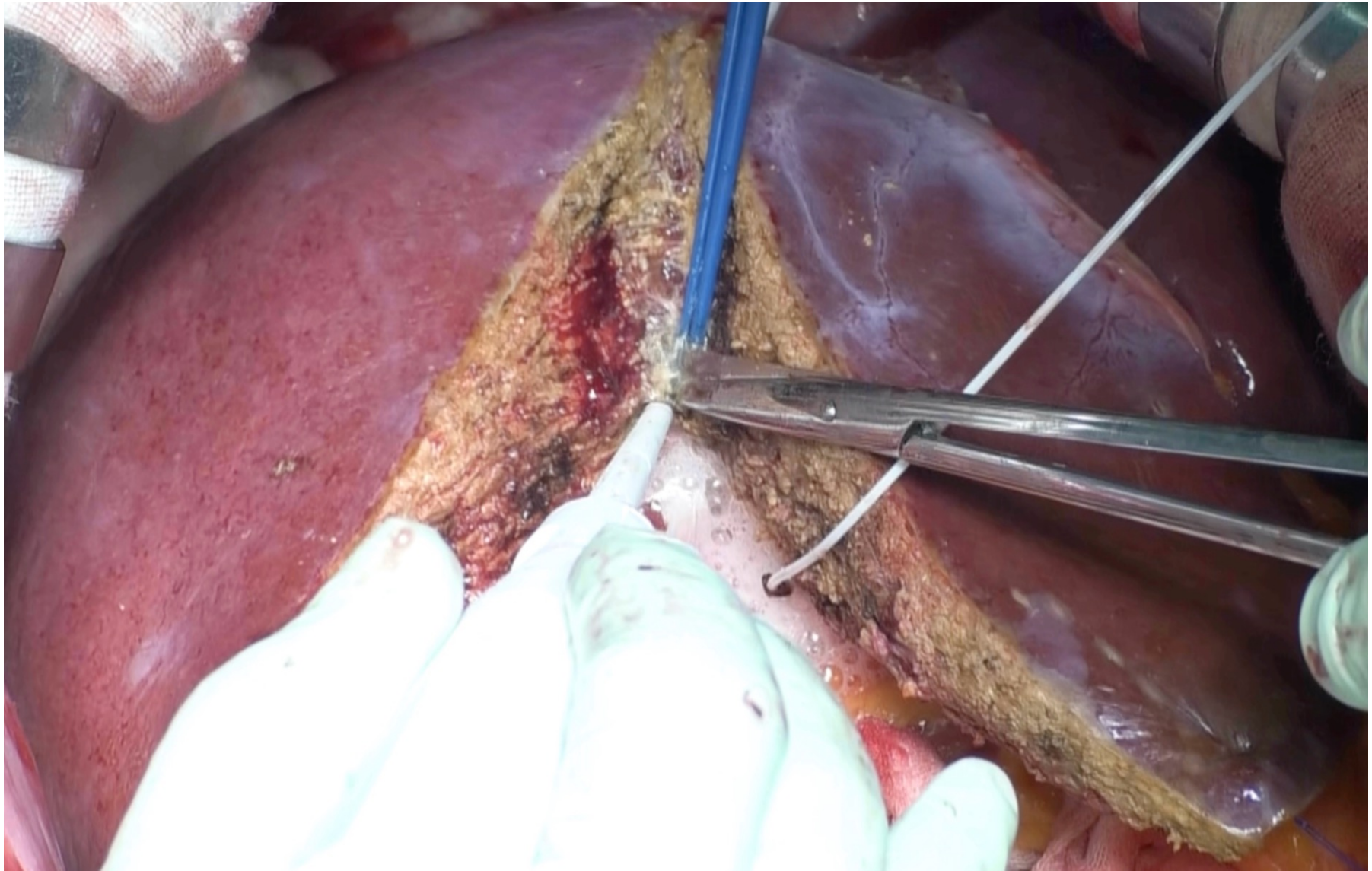


Gray dotted: tape around Glisson
Red line: tape around HA
Blue line: tape around PV
Hp: hilar plate

Bile duct is easily obtained
by subtracting HA and PV from
Glissonean pedicle

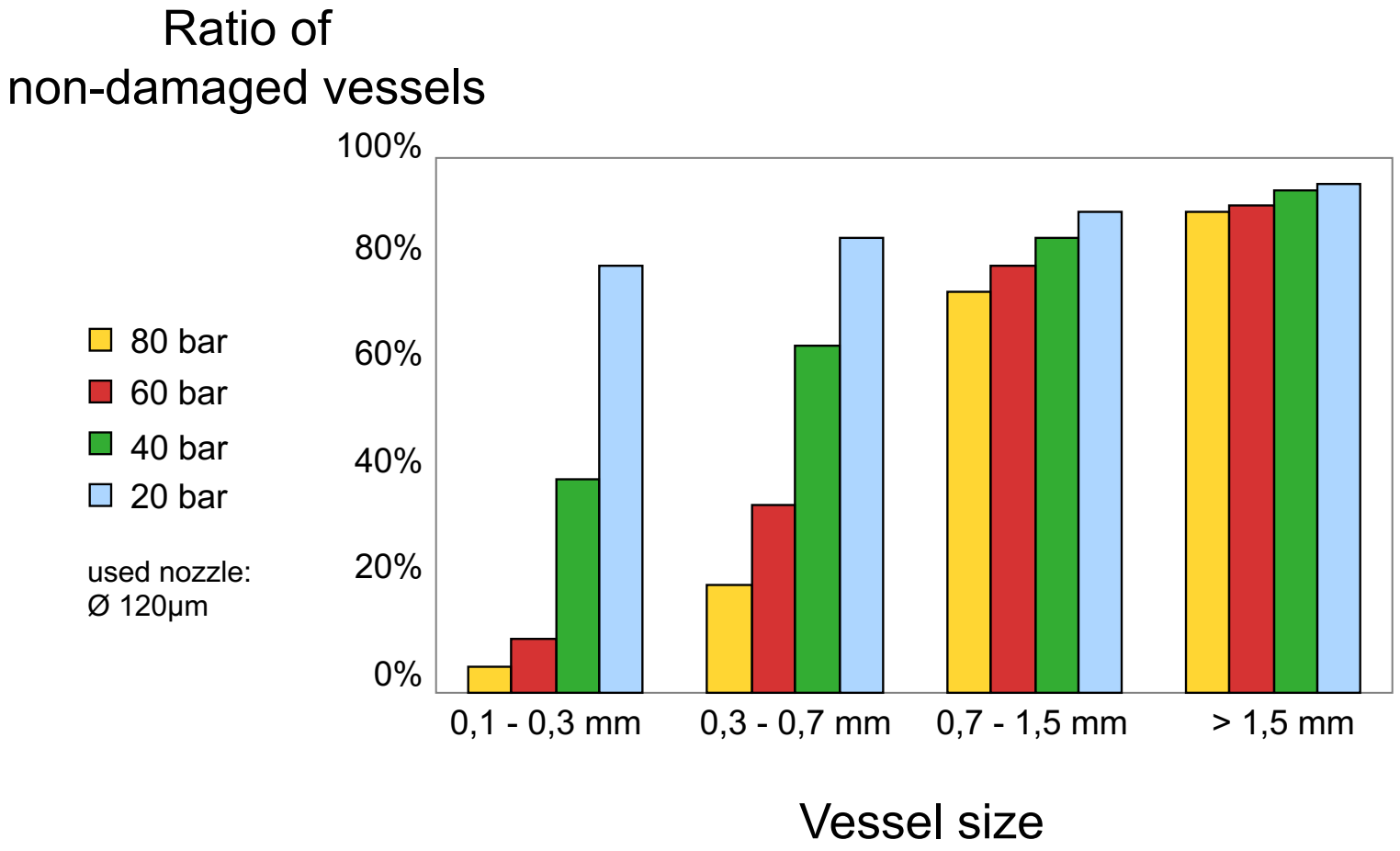
Yagi 2016 *Shujutsu*(Operation）

Step 6: parenchymal dissection



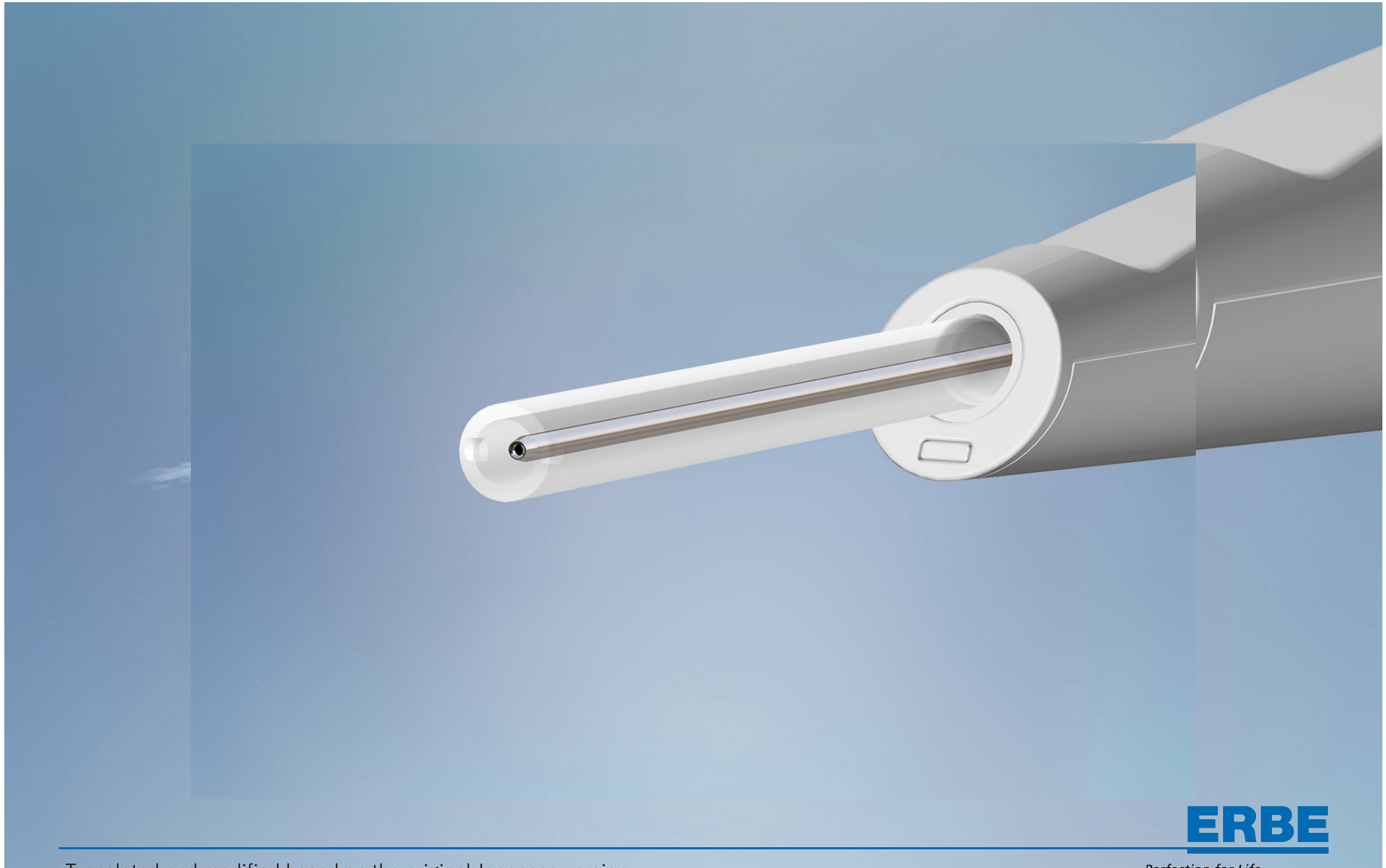
Damage to vessels:

vessels size and pressure of projected water (animal experiment)

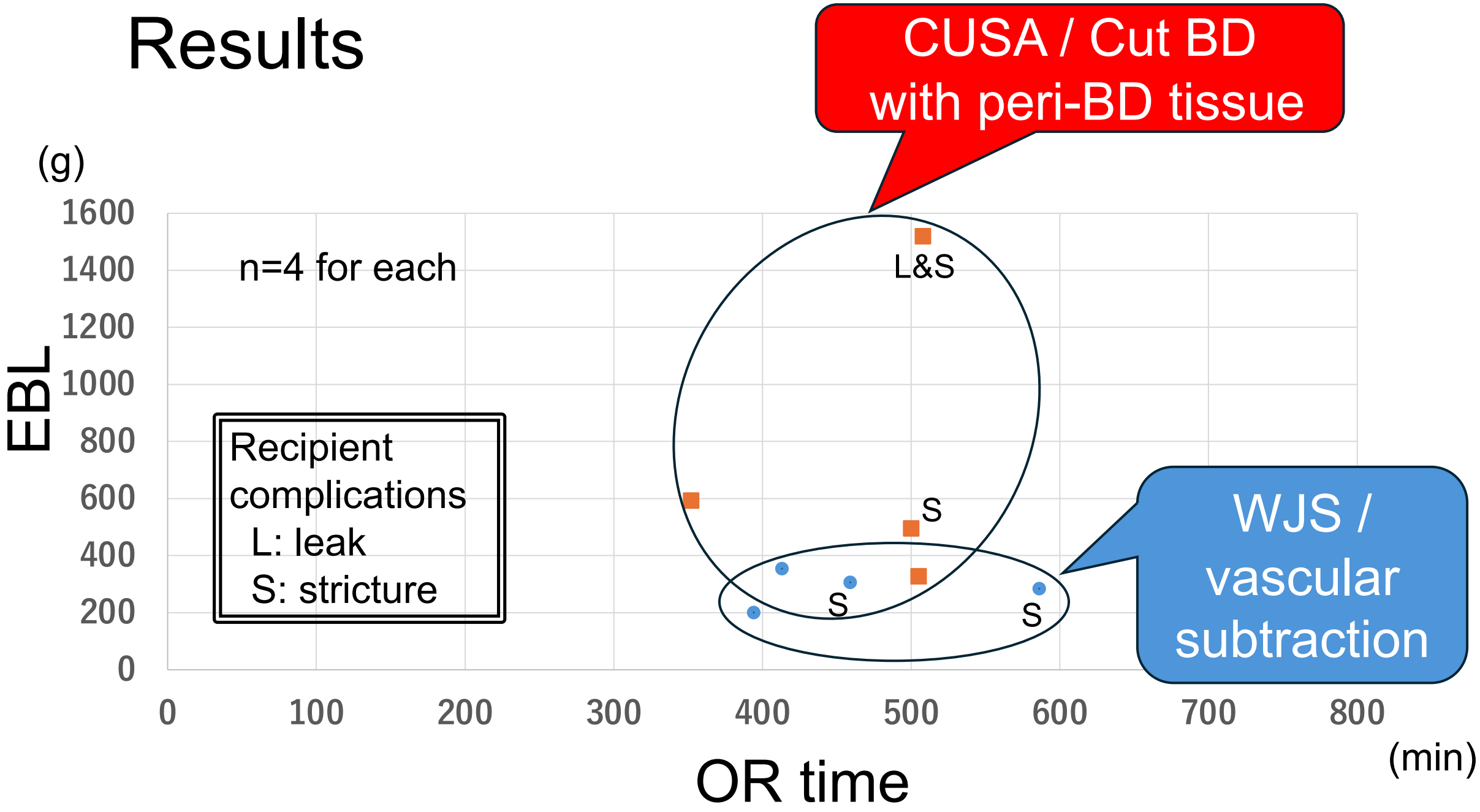


Source: Rau, H.G. (1994): Professorship Thesis at L-M-University, Munich

Integrated (nozzle/suction) hand piece



Results


CUSA / Cut BD
with peri-BD tissue
(g)
1600
1400
1200
1000
800
600
400
200
0
EBL
n=4 for each
Recipient
complications
L: leak
S: stricture
L&S
S
S
S
WJS /
vascular
subtraction
0
100
200
300
400
500
600
700
800
(min)
OR time

Conclusion:

- Use of the techniques introduced here ensures preservation of the periductal blood supply and facilitates reduction of bleeding during a hepatic parenchymal resection procedure.