Update On Transvenous Liver Biopsies: What Equipment Is Needed And How To Do Them

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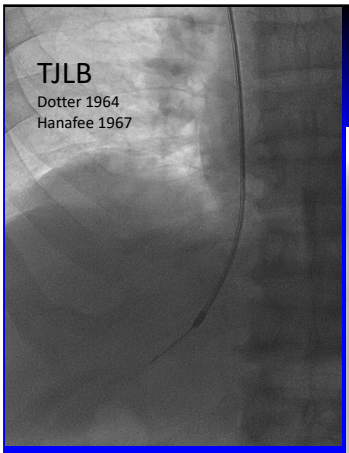
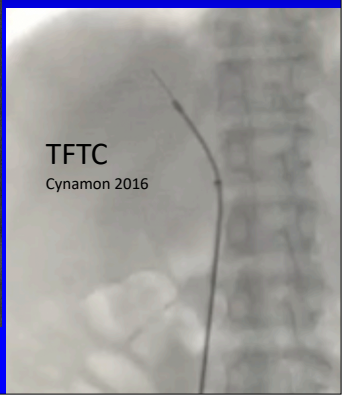
Disclosures

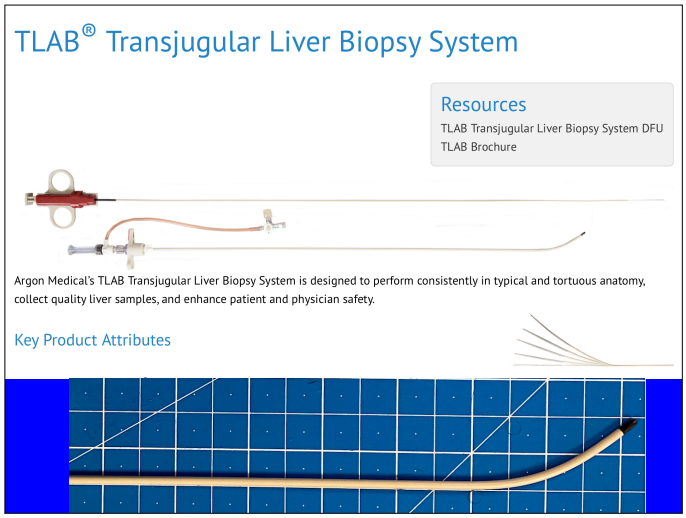
- Transfemoral Transcaval Liver Access and Devices
- US Patent Number 10,448,931
- ARGON: Speaker, Advisor, Royalties

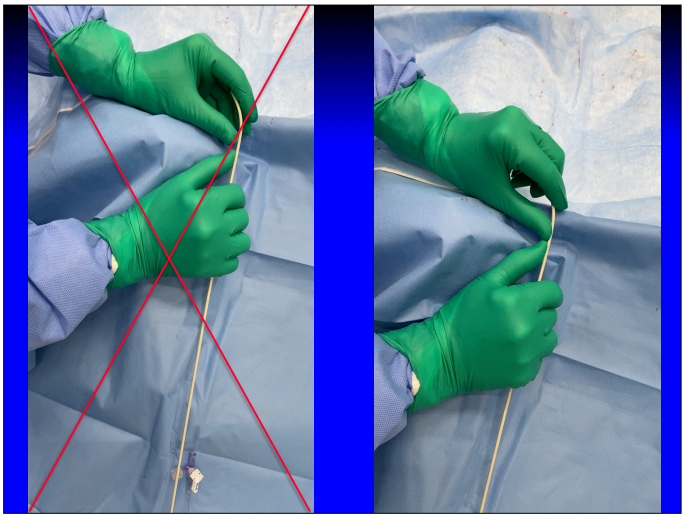
Transvenous Liver Biopsies

- Liver Biopsies in patients with
  - Coagulopathy
  - Anticoagulation
  - Antiplatelets/ low Platelets
  - Ascites
  - Obesity
  - Hepatic Vein and Portal Vein Pressures

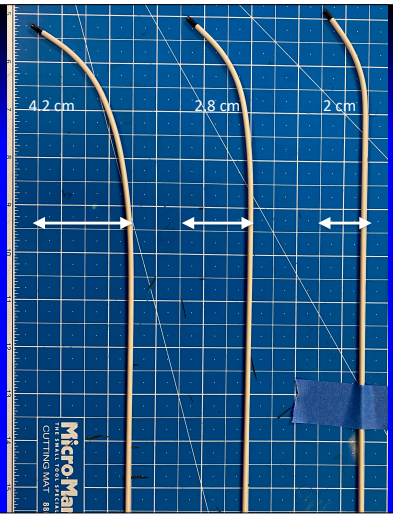


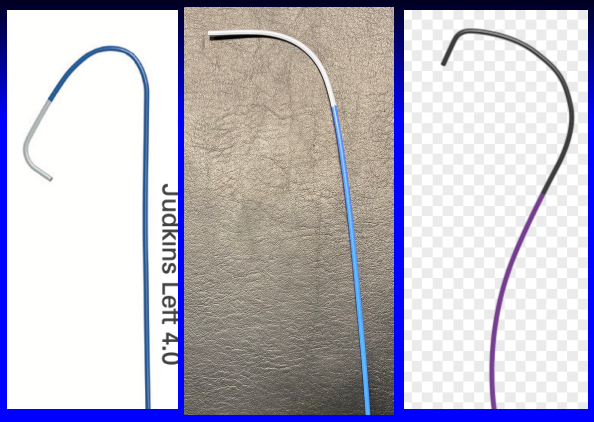






Modified Curves

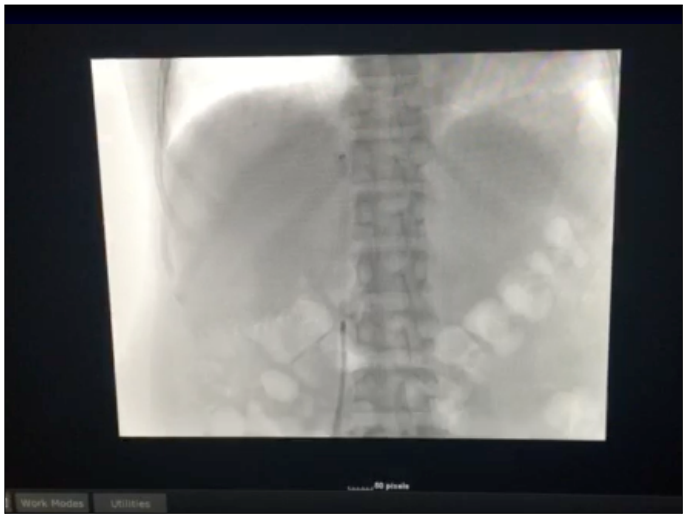


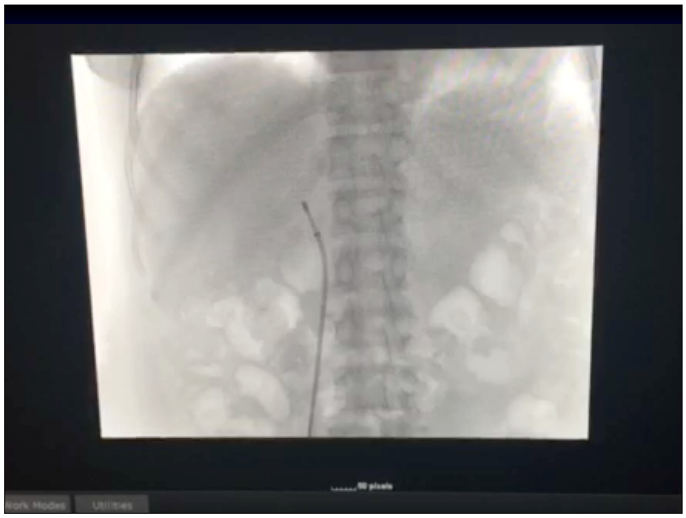


Catheters used for selecting HV for Free and Wedge pressures
JL4, Curved Catheter (Comes with TLAB), Cobra

Always Review Cross Sectional Images To Plan the Biopsy

Biopsy via the Intrahepatic IVC, Usually 1 vertebral body below a normally inserting HV (Turn the 7Fr Stiffened Sheath- Lateral, Slightly Anterior)





Transjugular versus Transfemoral Transcaval Liver Biopsy: A Single-Center Experience in 500 Cases

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ABSTRACT

Purpose: To compare the safety and efficacy of transfemoral transcaval liver biopsies (TFTC) with that of transjugular liver biopsies (TJLB) at a single tertiary-care institution.

Materials and Methods: A retrospective review was performed of 500 consecutive transvenous liver biopsies between December 2010 and December 2018. The cases included 286 TFTC patients at a median age of 54 years old (interquartile range [IQR], 42–63 years of age), 37.4% were female; and 214 TJLB patients at a median age of 55 years old (IQR, 46–61 years of age), 45.4% female. Patient demographic and laboratory data and technical and histopathological success, fluoroscopy times, and complications were recorded. Comparative statistical analyses were performed using a 2-sample test or a Wilcoxon ranked sum test for continuous variables and a chi-square test or Fisher exact test for categorical variables when appropriate.

Results: TFTC and TJLB data are presented as: technical success rates of 99.3% (283 of 286) and 100% (214 of 214), respectively; histopathologic success rates of 96.5% (275 of 285) and 95.8% (205 of 214), respectively; and major complication rates of 1.4% (4 of 284) and 5.6% (12 of 214), respectively ($P = .009$). There were no hepatic injuries in the TFTC group, whereas the TJLB group included 6 significant hepatic injuries requiring intervention. Median fluoroscopic times were 5.5 minutes (IQR, 3.9–8.6 minutes) for TFTC and 8.1 minutes (IQR, 5.2–13.1) for TJLB ($P < .001$).

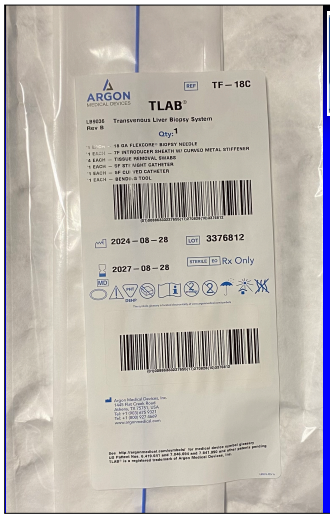
Conclusions: In this single-institution study, TFTC was associated with a lower major complication rate and lower fluoroscopy times than conventional TJLB with similar technical and histopathologic successes.

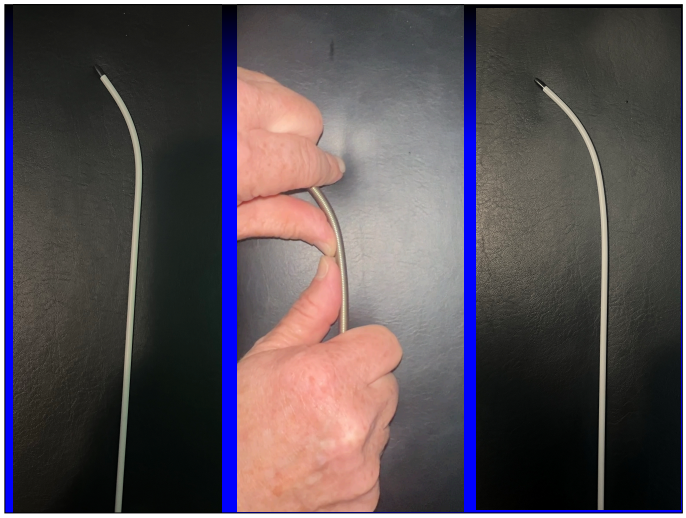
TFTC vs. TJLB

Demographics	TFTC (N=286)	TJLB (N=214)
Age, median (IQR)	54 (42-63)	55 (46-61)
Female (%)	107 (37.4)	97 (45.3)
Transplant livers (%)	41 (14.3)	30 (14.0)
Transvenous Indications	**TFTC (N=286)**	**TJLB (N=214)**
Coagulopathy	52 (18.2)	46 (21.5)
Thrombocytopenia	143 (50.9)	120 (56.1)
Ascites	71 (24.8)	28 (13.1)
Difficult Perc bx alone	7 (1.4)	4(1.9)
PV pres. alone	72 (25.2)	34 (15.9)

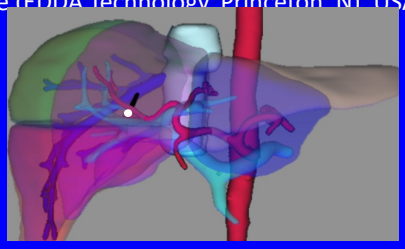
Results

	TFTC (N=286)	TJLB (N=214)	p-value
Tech Success	99.0 (283/286)	100 (214/214)	0.1863
Histopath Success	98.3 (281/286)	98.1 (210/214)	0.1680
Fragmentation rate	4.2 (12/286)	17.8 (38/214)	<0.0001
Major Complications	1.4 (4/286) 0 Intrahepatic bleed 2 Sepsis 2 Femoral Bleed (Rx'd w PS)	5.6 (12/214) 6 Intrahepatic bleeds 3 Subhepatic bleeds, 2 Sustained Arrhythmias 1 Access site bleed	<0.01
Mean Fouro Time	5.5 (3.9-8.6)	8.1 (5.2-13.1)	<0.0001



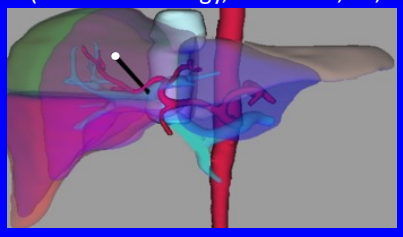


3-D simulation model of needle pass trajectory using the TJLB technique. Images created with IQQA® imaging software (EDDA Technology, Princeton, NJ, USA).



- White circle at the end of the needle (depicted in black) indicates the needle tip.
- TJLB via the Right HV- Needle trajectory points toward the right hepatic artery and portal vein.

3-D simulation model of needle pass trajectory using the TFTC technique. Images created with IQQA® imaging software (EDDA Technology, Princeton, NJ, USA).

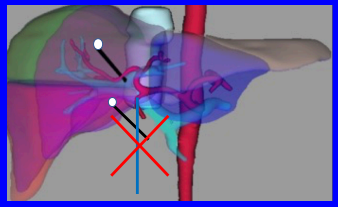


- White circle at the end of the needle (depicted in black) indicates the needle tip. The right hepatic vein (blue) was included in the first image for orientation.
- TFTC needle trajectory points superior to the right hepatic artery and portal vein, thus avoiding potential bleeding complications.

	Updated 657 Cases	Prior 286 Cases
Age (SD)	51.5 (±17)	50.8 (±16)
Female	42.0% (259/657)	37.4% (107/286)
Technical Success	99.4% (653/657)	99.3%
Histopathological Success	97.1% (638/657)	96.5%
Portal Pressure Measurements	100% (500/500)	100% (235/235)
Severe Complications	1.2% (8/657) overall • 3 sepsis • 2 access site bleeds **3/657 (0.45%) biopsy related** • 1 GI bleed • 1 gallbladder fossa bleed • 1 biliary leak	1.4% (4/286) overall • 2 sepsis • 2 access site bleeds 0 biopsy related
	One patient died 4 days post biopsy due to continued deterioration of her underlying disease (HLH)	

Common Denominator: Transcaval Bx was Too Low and/or Too Anterior

Trajectory of TFTC



Why TFTC vs TJLB

- No need to traverse the right atrium
- No need to advance the rigid cannula into the hepatic vein, or differentiating right and middle HV
- HV (Free and Wedged) Pressure measurements can be easily obtained
  - My preferred catheter/wire=JL4/Stiff angled Glide
- Ease of multiple biopsies
- Single operator
  - Needle is directed away from the central hepatic vasculature
  - **(Review Cross Sectional Imaging/ Beware of low/Ant Biopsy)**

- Quicker, Safer Procedure

Order Set should be changed to Transvenous Liver Biopsy Operators Choice