



8TH - 10TH NOVEMBER, 2024 | GRAND HYATT MUMBAI

Registration number: 207

Title of the presentation:

N-butyl cyanoacrylate vs vascular plug-N-butyl cyanoacrylate combination as embolic agent for pre-operative portal vein embolization: A randomized controlled trial. (interim analysis)

Authors and Institute:

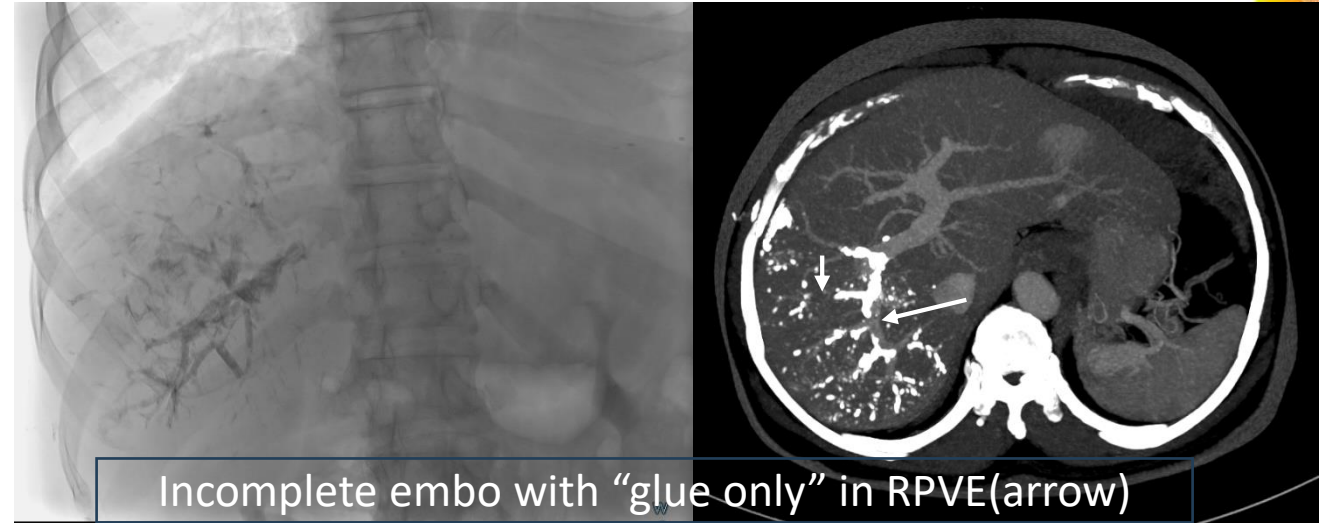
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Introduction:

- Partial hepatectomy is standard of care for an increasing number of patients with HPB malignancies ¹
- Resectability criteria demand negative margins and sufficient future liver remnant volume (FLRV)
- Extended Rt hepatectomy: high risk of postop liver insufficiency
- smaller FLR develop more complications after hepatectomy
- Combining NBCA with a vascular plug has been demonstrated to be safe and effective in achieving adequate FLR hypertrophy while avoiding non-target embolization²

Hypothesis



GLUE only

vs

Vascular plug and glue

- Non-target/FLR embolization-risk high
- Recanalization of right PV d/t incomplete proximal embolization

- Less chance of Non-target/FLR embolization
- Complete proximal embolization
- better hypertrophy due to robust embolization(proximal-by plug and distal-by glue)

Aims/ Objectives:



Primary Objective:

1. Assessment of absolute FLR hypertrophy at 28 days after PVE. FLR absolute hypertrophy was calculated as $(\text{FLR volume after PVE} - \text{FLR volume before PVE}) \times 100 / (\text{FLR volume before PVE})^3$

Secondary Objectives:

1. total contrast material volume used,
2. pain intensity according to visual analog scale (range, 0–10),
3. total fluoroscopy and procedure time,
4. minor and major complications, and hospital stay.

Methodology:

Pre-op Workup:

- Pre-PVE CT, PVE according to the hepatic volumetry and underlying disease.
- Pre PVE exploratory LAP



- ✓ PTBD/ERCP in patients with biliary obstruction before PVE (target tBIL <3)
- ✓ For HCC, TACE f/b PVE



PVE with glue/lipiodol



f/u CT after 4 wks

- ✓ FLR hypertrophy
- ✓ Distant mets

→ **hepatectomy**

- ❖ healthy liver, the FLR should be at least 25% of TLV;
- ❖ preop chemotherapy, the FLR should be at least 30% of TLV.
- ❖ liver cirrhosis, the FLR must be at least 40% of TLV.

VOLUMETRY:

- ❖ Myrian software, intrasense, france



INSTITUTIONAL ETHICS COMMITTEE
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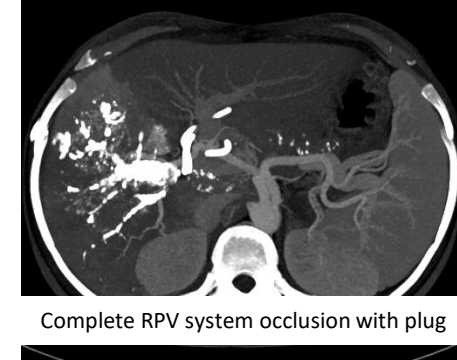
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Through Guide: Dr Tara Prasad Tripathy

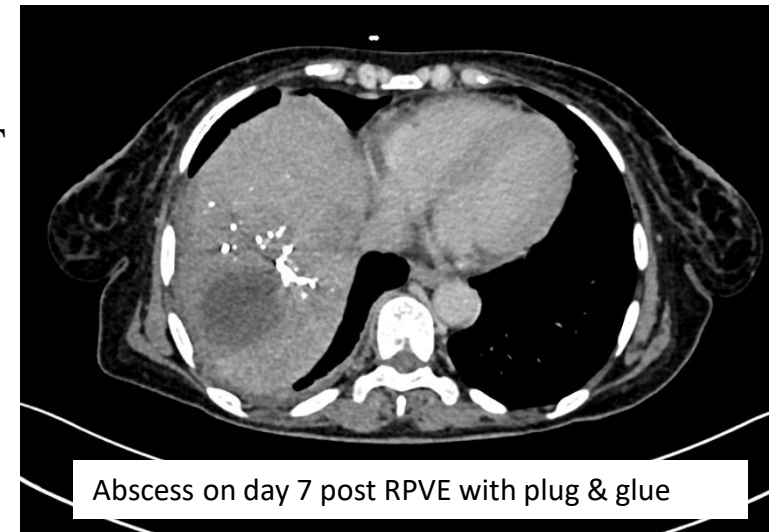
Subject: N-butyl cyanoacrylate vs vascular plug and N-butyl cyanoacrylate combination as embolic agent for pre-operative portal vein embolization: A randomized controlled trial.

- Embolizing agent: **Gr 1:** NBCA/Lipiodol and vascular plug combination
Gr 2: NBCA mixed with lipiodol (1:4)

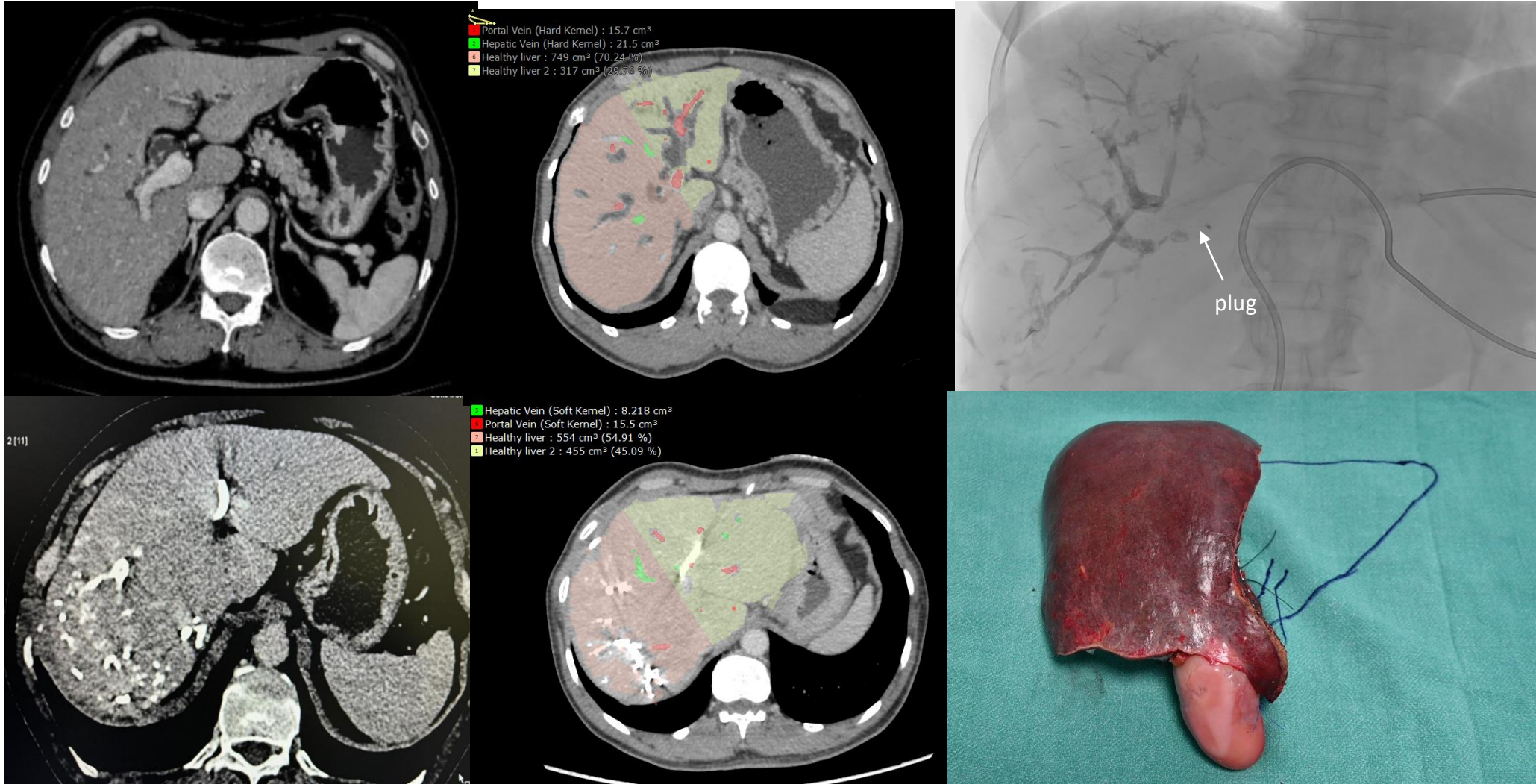
Results:



- Ten participants were assigned each to Group 1 and Group 2 respectively
- Interim analysis revealed **superior liver hypertrophy** for the group 1 (absolute hypertrophy of 46% vs 30% [$P = .001$])
- **Liver growth for the proposed hepatectomy** was achieved in 70% of participants (7/10) in group 1 versus 60% of participants (6/10) in group 2 ($P > 0.05$) 28 days after PVE
- **Liver failure** occurred in 10% of participants (1/10) in group 1 and in 30% of participants (3/10) in the group 2 ($P = .27$).
- The amount of NBCA, fluoroscopic time for procedure, pain intensity and radiation dose was similar in both groups.
- Imaging wise **complete proximal occlusion** was seen in Group 1 (10/10) whereas partial recanalization was present in 40% (4/10) in group 2.
- **Clinically insignificant glue in left lobe** reported on follow up CT present in 0/10 cases in group 1 whereas 2/10 in group 2.
- **Post PVE with right biliary system cholangitis and abscess-** 3/10 in group 1 and 1/10 in group 2.
- **No major complication** post PVE in either groups



54 year old male, CA GB with type IIIa hilar block, RHA encasement, ongoing chemotherapy, inadequate FLR (29%), underwent PVE with glue and vascular plug combination (arrow), post PVE FLR 45%, subsequently underwent right hepatectomy with uneventful post hepatectomy outcome.



Conclusion:



- Preoperative PVE with both NBCA and Vascular plug-NBCA is safe and effective for increasing FLR volume in patients of all age group and even in patients with an underlying liver parenchymal disease with hepatobiliary malignancy
- Superior hypertrophy was noted in patients undergoing PVE with Vascular plug-NBCA
- PVE with Vascular plug-NBCA combination is safer in avoiding non-target glue embolization
- Slightly higher rates of right biliary system cholangitis and abscess formation in Vascular plug-NBCA combination is worrisome in interim analysis-likely due to more inflammation/mass effect at hilum by vascular plug

References:



1. Heinrich S, Lang H. Hepatic resection for primary and secondary liver malignancies. *Innov Surg Sci*. 2017 Mar 24;2(1):1-8. doi: 10.1515/iss-2017-0009. PMID: 31579727; PMCID: PMC6754009.
2. Bent CL, Low D, Matson MB, et al. Portal vein embolization using a nitinol plug (Amplatzer vascular plug) in combination with histoacryl glue and iodinated oil: adequate hypertrophy with a reduced risk of nontarget embolization. *Cardiovasc Intervent Radiol*. 2009 May;32(3):471-7. doi: 10.1007/s00270-009-9515-9. Epub 2009 Feb 5. PMID: 19194742.
3. Taub R. Liver regeneration: from myth to mechanism. *Nat Rev Mol Cell Biol*. 2004;5(10):836–847. [[PubMed](#)] [[Google Scholar](#)]