

## Introduction

- Bupivacaine is a local anesthetic which has been increasingly used in the post-operative state for pain control.
- Hepatotoxicity is a rare complication, and few cases are reported in patients with chronic liver disease.
- We present a case of acute liver injury from bupivacaine use in a healthy patient without prior history of liver disease.

## Case Description

A 68-year-old female without prior liver disease suffered a nontraumatic complete tear of the right rotator cuff. She subsequently underwent arthroscopy of the right shoulder with repair of the rotator cuff. Her surgery was uncomplicated, and patient was started on bupivacaine ON-Q pump infusion at 5 ml/hr for three days for post-operative pain. Two weeks later, she presented to the hospital with fatigue, loss of appetite, and nausea. Physical exam demonstrated jaundice with scleral icterus with mild periumbilical tenderness to palpation without hepatosplenomegaly or ascites. Labs demonstrated elevated total bilirubin of 10.2 mg/dL with Alkaline phosphatase, ALT, and AST being 924 U/L, 429 U/L, and 279 U/L, respectively. Imaging studies including CT abdomen and pelvis with contrast, abdominal ultrasound, MRCP, and portal vein doppler were negative. Additional work up for underlying liver disease were negative, as noted in the table. It was determined patient had bupivacaine induced hepatotoxicity. Patient's symptoms completely resolved, and she was discharged with follow-up appointment with Transplant Hepatology. Additional work-up by the Transplant Hepatology service were negative, as shown in the table.

Table 1: Workup Completed for ALF

Acetaminophen	<2.0 ug/mL
Ethanol	<3 mg/dL
EBV IgM	<10.0
EBV IgG	<b>135 (H)</b>
UDS	Negative
AFP	4.73 ng/mL
CEA	3.1 ng/mL
Anti-smooth muscle antibody	4.7
Mitochondrial antibody	4.1
ANA	1:320, speckled
Hepatitis A antibody	Non-reactive
Hepatitis B Core total antibody	Non-reactive
Hepatitis B Surface antibody	Non-reactive
Ceruloplasmin	29.6 mg/dL
Alpha-1 antitrypsin	168 mg/dL
Phosphatidylethanol	277
CA 19-9	<b>53.1 (H)</b>

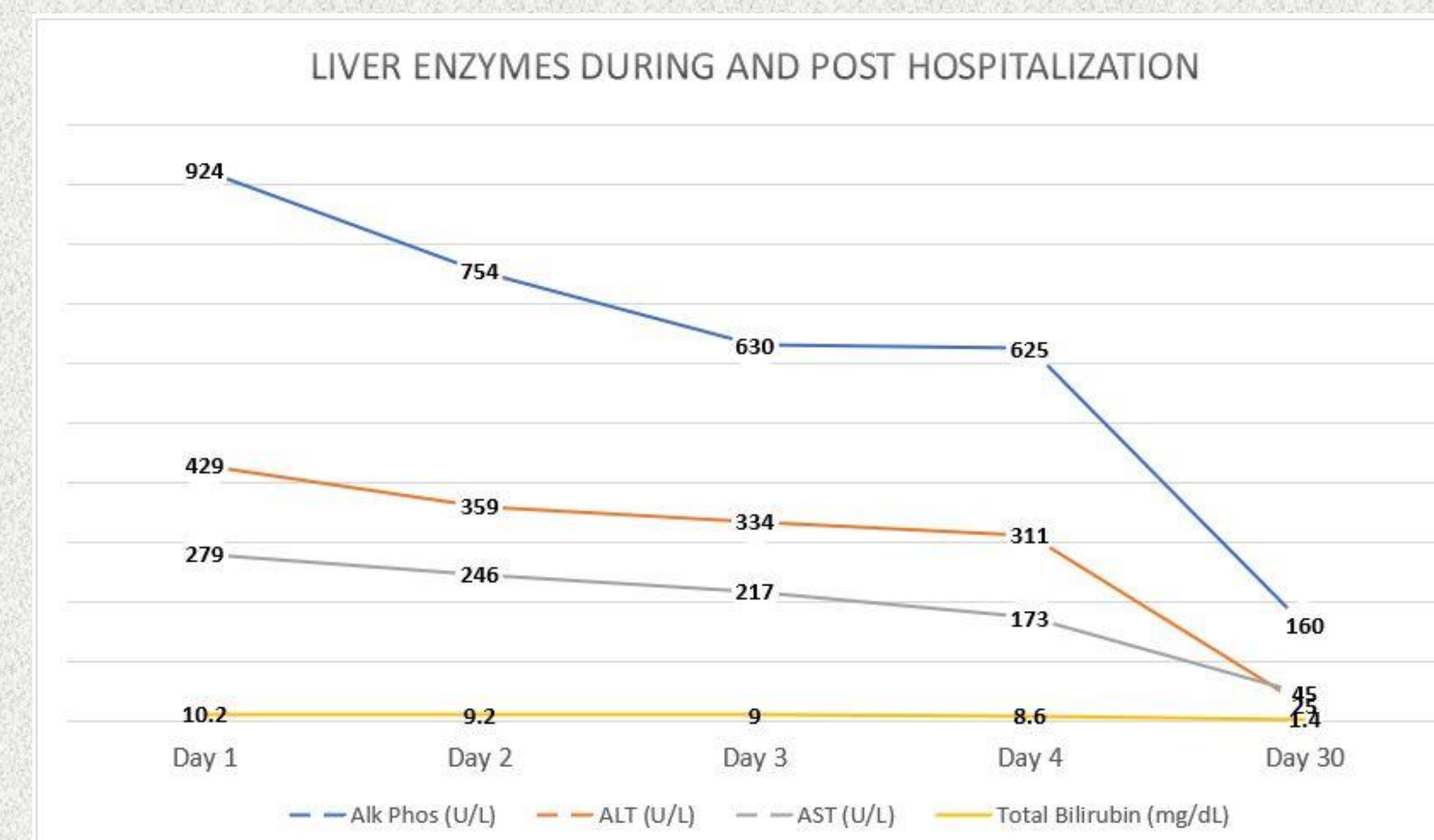


Chart 1: Improvement in Liver Enzymes Over One Month Period

## Discussion

- Bupivacaine is an amino-amide anesthetic which binds to the intracellular portion of voltage-gated sodium channels and prevents depolarization of pain signals.
- On-Q infusion pump is used to slowly administer local anesthetics (eg, bupivacaine) around surgical wound sites and/or near peripheral nerves for postoperative analgesia.
- Most common side-effects of bupivacaine injection include pruritis, nausea, constipation, and headache.
- Bupivacaine is metabolized by the liver and thus reports of hepatotoxicity, although rare, occur in patients with underlying liver pathology.
- Our patient became symptomatic with acute rise in LFTs. An extensive workup for other etiologies of acute liver toxicity was negative.
- Rapid vascular uptake of the drug is the most common reason for bupivacaine toxicity; and this remains a possibility for the mechanism of toxicity in our patient.
- A prior case report of bupivacaine hepatotoxicity demonstrated a cholestatic pattern, which is consistent with our findings.

## Conclusion

- Bupivacaine should be used with caution given the risk for acute liver failure.
- Most patients with bupivacaine induced liver toxicity have complete recovery of their liver function with supportive management.

## References

- Shafiei FT, McAllister RK, Lopez J. Bupivacaine. [Updated 2022 Jun 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-.