Postoperative Acetaminophen-Induced Acute Liver Failure Complicated by Postsurgical Septic Shock: A Catch-22

Melissa Chang, MD[1], Alkananda Behera, MBBS[1], Crystal Joseph, MD, MS[2], Dario Winterton, MD, MMSc-Med Ed[1]

[1]Beth Israel Deaconess Medical Center, Department of Anesthesia, Critical Care and Pain Medicine [2]Brigham and Women's Hospital, Department of Anesthesiology, Perioperative and Pain Medicine

ASRA PAIN MEDICINE
25th Annual Pain Medicine Meeting
November 5-7, 2026 | Tampa, Florida
#ASRAFALL26

BACKGROUND

- Unintentional acetaminophen toxicity remains a **leading cause of acute liver failure (ALF)** in the US, yet it is underrecognized in the perioperative setting.
- Toxicity can follow **supratherapeutic intake (>10 g) over several days**, often from multiple acetaminophen-containing products; fasting and alcohol increase risk.
- Cerebral edema and infectious complications are difficult to treat in ALF patients, highlighting the importance of early recognition and initiation of treatment.
- Acetaminophen-induced ALF carries **~28–30% mortality**; up to one-third of patients need transplantation, the only therapy with proven survival benefit in poor-prognosis ALF.

CASE DESCRIPTION

- A 47-year-old man with psoriasis, GERD, and HFpEF (EF 56%) underwent **outpatient hemorrhoidopexy**, complicated by pelvic necrotizing soft tissue infection (NSTI).
- Undiagnosed NSTI caused severe pain, leading to unintentional acetaminophen overdose of **~7.8 g/day for 7 days**; serum level **5 µg/mL,** leading to development of **ALF.**
- Markedly elevated aminotransferases, **INR >3.5**, and hepatic encephalopathy; started on N-acetylcysteine, lactulose, and rifaximin upon admission.
- **58-day admission with 22 operations:** serial debridements and washouts, diverting loop transverse colostomy, and split-thickness skin grafts.
- Infectious complications included vancomycin-resistant Enterococcus urinary tract infection, ventilator-associated pneumonia, and *Candida albicans* peritonitis.
- Renal failure requiring CRRT; septic shock requiring vasopressors, large-volume transfusion, and broad-spectrum antimicrobial and antifungal therapy.
- **Not a transplant candidate** due to active multidrug-resistant bacterial and invasive fungal infection.
- Progressed to refractory multiorgan failure including respiratory failure, and persistent hepatic synthetic dysfunction with hemorrhagic and vasoplegic shock.
- Following multidisciplinary goals-of-care discussions, care was transitioned to comfort-focused measures, and the patient died shortly thereafter.

(HIDDEN) ACETAMINOPHEN COMBINATIONS

Over-the-Counter Products	Prescription Products
Acetaminophen + dextromethorphan ± doxylamine ± phenylephrine **(DayQuil/NyQuil)**	Hydrocodone + acetaminophen **(Norco/Vicodin)**
Acetaminophen + aspirin + caffeine **(Excedrin)**	Butalbital + acetaminophen + caffeine ± codeine **(Fioricet)**
Acetaminophen + caffeine + pyrilamine **(Midol Complete)**	Oxycodone + acetaminophen **(Percocet)**

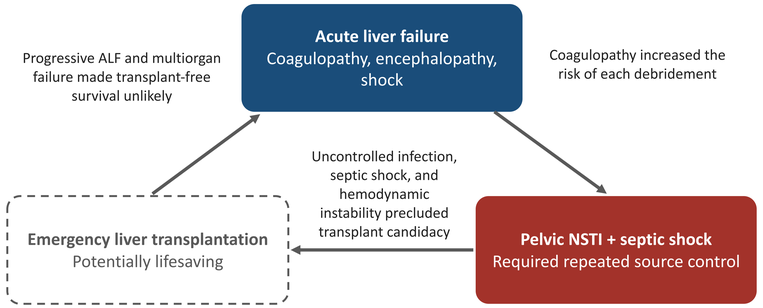
Table 1. Acetaminophen-containing Products

THE CATCH-22

Clinical course



Why transplant was never on the table



Escalating postoperative pain requires reassessment instead of escalating self-medication. Count acetaminophen from every prescribed and over the counter product, provide explicit discharge education, and use multimodal analgesia.

DISCUSSION

Clinical Relevance

- Rising rates of acetaminophen-induced ALF may reflect its presence in many OTC and prescription products and underappreciation of its hepatotoxicity.
- ALF with septic shock from postoperative NSTI created a clinical impasse: **coagulopathy and instability complicated source control, and active infection precluded transplantation.**
- **A low serum acetaminophen concentration does not exclude toxicity** after repeated supratherapeutic ingestion.
- Cumulative dose tracking is key in surgical patients, especially those at risk for hepatotoxicity.
- Consideration for systems-level safeguards : **cumulative dose alerts, dose tracking, multimodal analgesia, medication reconciliation, and discharge education.**
- Gaps in provider and patient education on daily maximums, combination products, and risk factors drive unintentional overuse.

Learning Points

- Treat unexpected or worsening postoperative pain as a **diagnostic warning sign**. Reassess for an evolving surgical complication.
- Count every source of acetaminophen. A **low serum concentration dose not exclude toxicity** after repeated supratherapeutic ingestions.
- Prevent accidental overdose at discharge. Provide explicit **cumulative-dose instructions**, **reconcile** OTC and prescription products, and establish a **multimodal analgesic plan**.

REFERENCES

1. Fontana, R. J., Liou, I., Reuben, A., Suzuki, A., Fiel, M. I., Lee, W., & Navarro, V. (2023). AASLD practice guidance on drug, herbal, and dietary supplement-induced liver injury. Hepatology. 2023;77:1036–65.
2. Fontana, R (2008). Acute Liver Failure Including Acetaminophen Overdose. *Med Clin North Am.* 2008;92:761–94.
3. Larson A. M. (2007). Acetaminophen hepatotoxicity. *Clinics in liver disease.* 2007;11:525–48.
4. Blieden, M., Paramore, L. C., Shah, D., & Ben-Joseph, R. (2014). A perspective on the epidemiology of acetaminophen exposure and toxicity in the United States. *Expert review of clinical pharmacology.* 2014;7:341–8.

Please scan QR code for electronic version of poster and submitted abstract.

Beth Israel Deaconess Medical Center

HARVARD MEDICAL SCHOOL TEACHING HOSPITAL