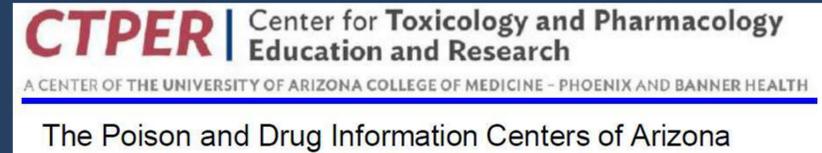


# Inverse Takotsubo Cardiomyopathy after Methamphetamine Use

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## Background

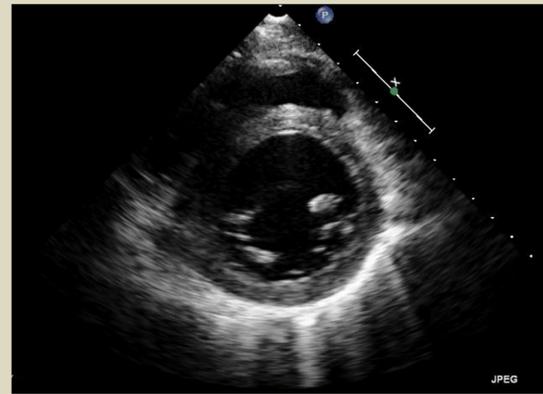
- Takotsubo cardiomyopathy (TC) is a reversible cause of heart failure from high adrenergic outflow.
- TC exhibits apical ballooning with hypokinesis.
- Inverse (or reverse) TC exhibits a normal or hyperdynamic apex with hypokinetic base.
- There are very few cases of drug-induced inverse TC (iTTC) described in the literature.
- Methamphetamine use has not previously been associated with inverse Takotsubo cardiomyopathy.

## Case

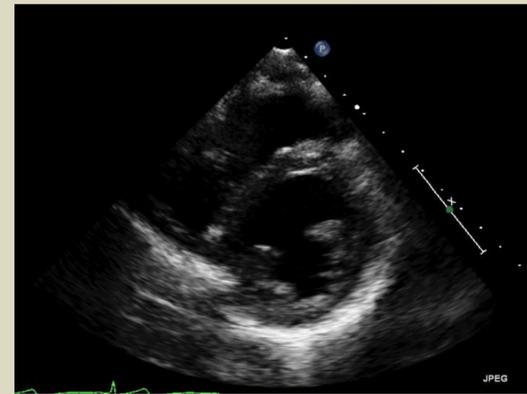
- 17 year old man with history of heroin, marijuana, and amphetamine abuse presented with 3 days worsening nausea, vomiting, and acute onset of chest pain after marijuana and methamphetamine use.
- Vital Signs: Afebrile, HR 143 bpm, RR 50 bpm, BP 109/64 mmHg, oxygen saturation 77% on room air.
- Pertinent exam findings at presentation: bilateral rales, absence of murmurs or peripheral edema.
- Laboratory at presentation:
  - Troponin I: 4.68 ng/mL (<0.05 ng/mL).
  - Pro-BNP: 18,701 pg/mL (<1584 pg/mL).
  - Urine GC/MS: methamphetamine, amphetamine, and cannabinoids
- CXR: Pulmonary edema with normal cardiac silhouette.
- Initial Echocardiography
  - Dilated left ventricle
  - Severely diminished motion in the basal and mid-wall segments with normal apical contraction
  - Left ventricular ejection fraction (LVEF) of 29%.

## Echocardiography

Day 3 Post-Exposure

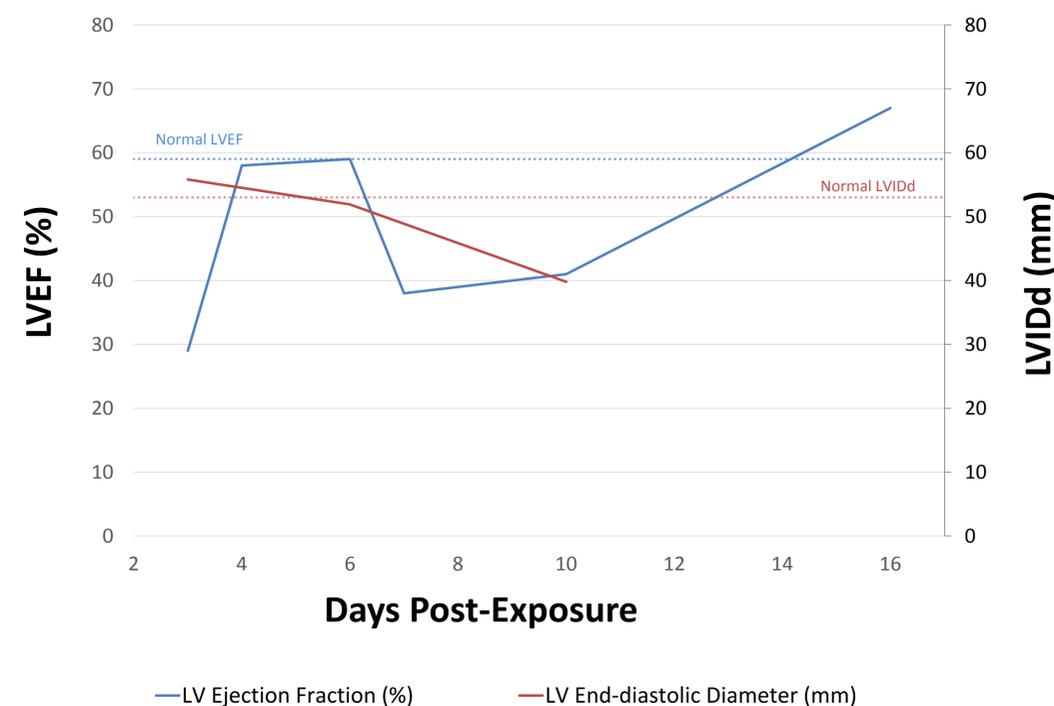


Day 72 Post-Exposure



*Initial LV dilation with complete resolution*

## LV Diameter and LVEF Over Time



## Management and Follow-up

- Patient was treated with lisinopril, spironolactone, carvedilol, and furosemide.
- Subsequent echocardiography (Figures): early improvement in ventricular dilation and gradual improvement of systolic function.
- Patient was found to have a left atrial thrombus that was treated with tPA and systemic anticoagulation
- Patient was discharged home.
- Cardiology follow up at days 16 and 72 post-exposure revealed normalization of LVEF but apparent concentric LVH.
- Patient was lost to further follow up.

## Discussion

- Lack of upper respiratory symptoms and temporal association between stimulant use and symptom onset suggest a drug-induced etiology for this patient's cardiomyopathy (CM) rather than infectious.
- Methamphetamine abusers may be at higher risk of developing CM compared to age-matched nonusers.
- Like other drug-induced CMs, TC and iTTC are typically transient.
- LVEF and wall motion abnormalities should improve within 3-5 days and return to baseline within days to weeks.

## Conclusion

- Methamphetamine use may lead to inverse Takotsubo cardiomyopathy.

