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ASRA PAIN MEDICINE

REFRACTORY INTRATHECAL PUMP TWIDDLERS'S SYNDROME AFTER MULTIPLE SUBCUTNEUS REVISIONS

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INTRODUCTION

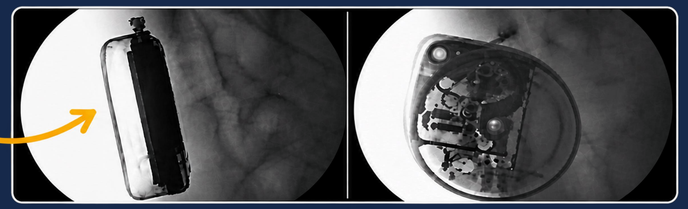
- Intrathecal drug delivery systems (IDDS) are susceptible to mechanical complications.[1]
- Twiddler's syndrome results from device rotation within its pocket.[2,3]
- Society guidance do not specify stepwise management algorythms for recurrent or surgically-refractory mechanical instability.[1]
- Established Twiddler's risk factors: higher BMI, young age, antipsychotic use, vigorous activity, and psychological factors. [2,3,5]
- Reported Twiddler's measures: non-absorbable sutures, suture sleeves/mesh, submuscular (subfascial) placement, and minimizing pocket size. [1,2,3,5]

METHODS

- Single-patient case report with focused literature review. Informed consent from patient was obtained for publication.
- Data obtained from pain medicine, emergency department, neurosurgical, operative, fluoroscopic, and refill records spanning >2 decades.

This patient's spinal pain pump kept **flipping,** even after **2 surgical revisions.**

One refill required a **manual 90° pump rotation** under fluoroscopy to access port and complete refill via lateral approach



(A) 180° INVERSION
Access port facing posteriorly into the abdomen

(B) 90° MANUAL ROTATION
Lateral fluoroscopy during pump refill

A **four-corner anchor**, instead of prior two-point stitch, finally **achieved secured subcutaneous fixation**

Risk factors in this patient included elevated BMI, recurrent postoperative seroma formation with progressive pocket enlargement, multiple prior pump procedures, initial two-point diagonal anchoring, and vigorous physical activity (including playing with her dog in the park)

PROPOSED STRATEGIES & FUTURE DIRECTIONS

STANDARDIZE 4-POINT FIXATION



not 2-point diagonal anchoring

Adopt **four-corner anchoring** as the standard technique at **initial implantation** — not a salvage step — when no contraindication exists.

HIGH-RISK MITIGATION IMPLEMENTATION

- **Subfascial (submuscular)** escalate placement depth
- **Surgical mesh** reinforce the implant pocket
- **Activity limitation** counseling on vigorous motion
- **Post-Surgical Abdominal Binder** for seroma prevention

For high-risk patients, or after any reported Twiddler's event

PROPOSED RISK STRATIFICATION & TAILORED CARE

Elevated BMI	+1
High physical-activity level	+1
Prior pump procedure / re-implant	+1
Longer duration on therapy	+1
Younger age	+1
Female sex	+1
Antipsychotic use	+1
Recurrent seroma tendency	+1

Total Points (Composite Risk Score) — LOW | MEDIUM | HIGH

ADVICE BY RISK TIER

Tier	Periprocedural Follow-up	Activity	Surgical / Site
HIGH	Periprocedural follow-up every 1–3 months, plus refill visits	Restrict vigorous or high-impact activity	Subfascial or subcutaneous plus mesh, 4-point fixation
MEDIUM	Periprocedural follow-up every 3 months, plus refill visits	Moderate activity counseling	Subcutaneous, 4-point fixation
LOW	No additional periprocedural follow-up — standard refill visit only	Standard activity guidance	Standard subcutaneous, 4-point fixation

Follow-up = periprocedural surveillance, additive to standard pump-refill visits (every 3–6 months)

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CLINICAL TIMELINE

Early 2000s | Initial IDDS Placement
Intrathecal pump implanted after failed spinal cord stimulation, providing **>20 years of durable analgesia.**

06/2024 | Battery End-of-Life
Pump battery approached end-of-life, prompted **referral for elective pump replacement.**

08/2024 | Pump Replacement → Acute Withdrawal
Patient developed **combined opioid/clonidine withdrawal** after pump replacement.

08/2024 | Emergent Surgical Catheter Revision
Catheter revision done with **restoration of pump function.**

09/2024 – 12/2024 | Progressive Enlargement Pocket Seromas
Recurrent pump-pocket seromas required serial aspirations of approximately **70 mL → 73 mL → 205 mL.**

12/2024 | First Documented 180° Pump Inversion
180° inversion noted on fluoroscopy (access port facing abdomen); refills aborted due to inaccessible access.

12/2024 | First Surgical Pocket Revision
Inactive anchoring ties and a freely rotating pump confirmed → **new superior subcutaneous pocket created.**

2025 – 01/2026 | Recurrent Flipping Despite Revision
Recurrent pump flipping → refill required **~90° manual rotation** under fluoroscopic guidance to obtain access.

01 – 02/2026 | Persistent Pump Inversion
180° inversion noted on repeat evaluation → neurosurgical planning for definitive stabilization initiated.

03/2026 | 2nd Surgical Revision: 4-Point Subcutaneous Fixation
Revealed secured anchor sutures → pump secured with **four-point fixation** (prior diagonal/two-point anchoring).

DISCUSSION

- A temporal association between larger seroma volumes and more frequent flipping was observed.
- Seroma prevention may reduce mechanical instability and pocket enlargement.
- Flipping events recurred even after a new subcutaneous pocket was created. Subfascial fixation was not attempted and might have prevented recurrence.
- Events reoccurred with use of two-point fixation. Four-point fixation may be the initial fixation modality of choice.

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