

Case Discussion

——T2DM: When remission is not achieved

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Conflicts of Interest

I have no conflicts of interest to declare related to this presentation.

Demographics & History of Presenting Illness

Male patient, 38 years old

Chief complaint: Elevated blood sugar for 10 years, increased foam in urine for 4 years

Present medical history:

Elevated blood glucose was found during physical examination, with **fasting blood glucose at 6+mmol/L**, no polydipsia, polyphagia, polyuria, weight loss, fatigue, nausea, vomiting, abdominal pain, etc., and was not taken seriously

10 years ago

There was obvious thirst. Fasting blood glucose was measured at 10mmol/L. **Type 2 diabetes was diagnosed** and lifestyle intervention was initiated. Several months later, metformin was added. Blood glucose was not monitored regularly

6 years ago

Increased foam in urine, and **urine ACR was 283mg/g, HbA1c was 7.8%**. Dapagliflozin was 10mg qd was added.

4 years ago

His **HbA1c fluctuated between 8.5%-9%** and **serum creatinine gradually increased to 150umol/L-170umol/L**. Dulaglutide 1.5mg qw and glimepiride 2mg qd were added. Insulin gargine was initiated 6 months ago and glimepiride was discontinued.

1 year ago

Past Medical, Social, and Family History

Past medical history: Hypertension for 10 years, chronic kidney disease for 4 years, hyperlipidemia for 6 years

Social History : Non-smoker; denies alcohol consumption.

Family History:

- **Mother** (age 65) **and elder brother** (age 42) **both diagnosed with Type 2 Diabetes Mellitus** (on oral hypoglycemics).
- No family history of premature coronary artery disease, stroke, thyroid disorders, or hereditary malignancies in first-degree relatives.

Physical Examination & Initial Laboratory Findings

Physical Examination: Height 175 cm, Weight 105 kg, **BMI 34.2 kg/m²** . Vitals & General are all stable. BP 128/78 mmHg, HR 72 bpm, RR 16/min, T 36.7°C. No peripheral edema or acanthosis nigricans noted on inspection.

Initial Laboratory Findings

- Fasting Glucose: **7.51 mmol/L**
- HbA1c: **8.6%**
- Glycated Albumin: **19.68%**
- C-peptide: **1.6 ng/mL**
- Serum Creatinine (Cr): **169 µmol/L**, eGFR: **43 mL/min/1.73m²**
- UACR : **973.87 mg/g**
- Liver enzymes (ALT/AST): Within normal limits
- Lipid profile: TG 1.37mmol/l, TC 5.15mmol/L , LDL **2.92mmol/L** , HDL 1.37mmol/L

Patient Concerns & Treatment Decision

- **Patient's Current Primary Concerns (Patient-Reported Outcomes)**

- ✓ **Mobility limitation:** Severe obesity significantly restricting physical activity and daily movement.
- ✓ **Dietary fatigue:** CKD-related long-term dietary restrictions negatively impacting nutritional enjoyment and compliance.
- ✓ **Medication burden:** Polypharmacy (multiple oral agents) substantially reducing quality of life and treatment adherence.
- ✓ **Fear of weight gain:** Reluctance to initiate insulin therapy due to concern over further weight accretion.
- ✓ **Fear of disease progression:** Persistent anxiety that suboptimal glycemic control will accelerate diabetic complications (e.g., nephropathy, retinopathy, cardiovascular events).

- **Shared Decision-Making & Next Steps**

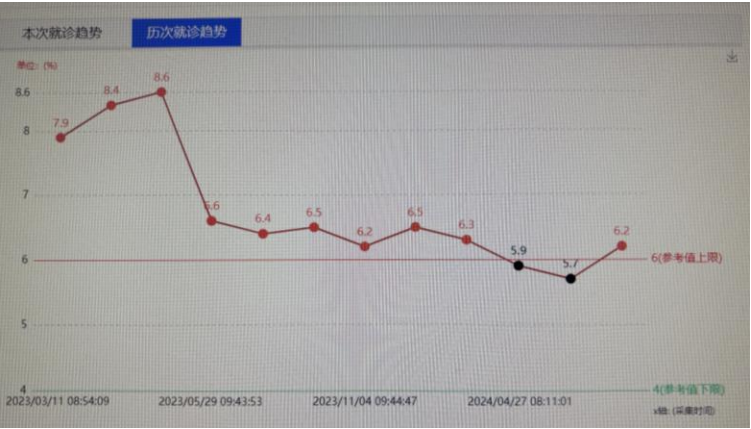
- ✓ After thorough multidisciplinary counseling regarding risks, benefits, and alternatives, the patient elected to proceed with **metabolic surgery**.
- ✓ **Plan:** Commence comprehensive preoperative evaluation and optimization (including cardiac, pulmonary, and anesthetic risk stratification) to ensure surgical eligibility.

Postoperative Course & Early Outcomes

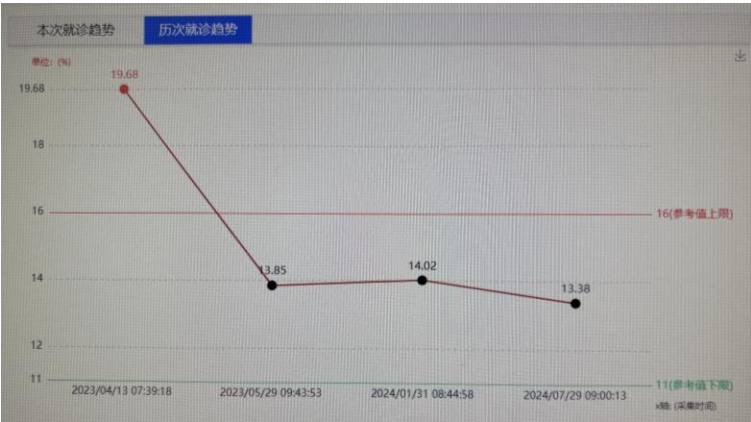
- **Weight loss:** At 1 week post-surgery, the patient achieved a 4-kg weight reduction.
- **Glycemic control:**
 - In-hospital capillary glucose levels remained stable, ranging 6–9 mmol/L throughout the day, with no hypoglycemic events.
 - Total daily insulin dose was reduced by **60%**; dapagliflozin was continued due to persistent proteinuria (macroalbuminuria).
- **Blood pressure management:**
 - Remained well-controlled, with readings consistently around **120/75 mmHg** during the postoperative hospital stay.
 - The antihypertensive regimen was successfully streamlined from **3 agents to 1** single agent.

Longitudinal Laboratory Trends

HbA1c (%)



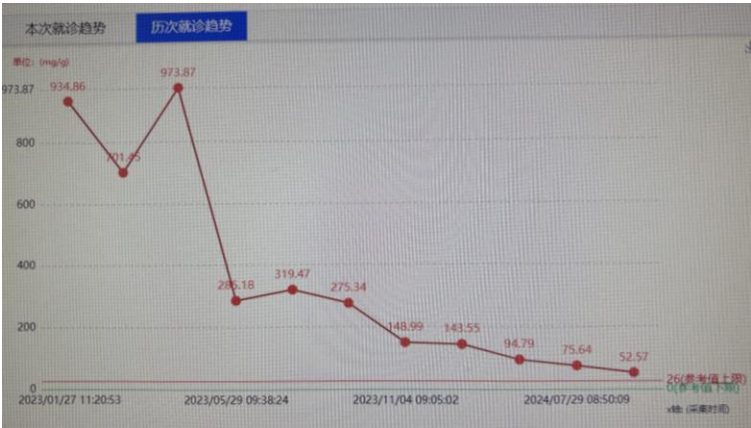
GA (%)



FPG (mmol/L)



UACR (mg/g)



eGFR (ml/min)



Type 2 Diabetes Remission –Definition & Patient Outcome

ADA Definition

- *“Remission should be defined as a return of **HbA1c to less than 6.5%** (Alternative: Fasting glucose < 7.0 mmol/L) that occurs spontaneously or following an intervention and that **persists for at least three months in the absence of usual glucose-lowering pharmacotherapy.**”*

This Patient – 1-Year Post-Surgery

Off all glucose-lowering agents: > 12 months

HbA1c: 6.2% (< 6.5%)

Fasting glucose: 5.89 mmol/L (< 7.0 mmol/L, alternate criterion)

→ Remission achieved and maintained.

Weight Regain & Glycemic Deterioration

– What to do next?

Current Status

Parameter	Postop 1 Year	Current (~ 1 yr 10 mo)	Change
Weight	82 kg (-23 kg)	88kg (regain 6kg)	↑ (26.1% of lost weight)
BMI	26.8 kg/m ²	28.7 kg/m ²	↑
HbA1c	6.2%	6.9%	↑
Fasting Glucose	5.89 mmol/L	7.0mmol/L	↑
Glucose-lowering drugs	None	None (still off medication)	—

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Clinical Interpretation

- HbA1c $\geq$ 6.5% and FPG $\geq$ 7.0 mmol/L → **Remission lost** (per ADA 2021 criteria)
- **Weight regain > 20%** of lost weight is a critical factor associated with metabolic relapse

Next Steps – Stepwise Management

Intervention

- Continue lifestyle modification
- Tirzepatide initiated as adjunctive therapy following weight regain and loss of remission
- Dose up-titrated gradually to 10 mg once weekly (maintenance dose)

Clinical Outcomes

✓ Weight

- Weight regain successfully reversed
- Returned to post-surgical nadir (82 kg; BMI 26.8 kg/m²)

✓ Glycemic Control

- Fasting plasma glucose consistently maintained < 6.1 mmol/L
- HbA1c (if available) pending / improved (clinically correlated)

✓ Renal Function & Proteinuria

- Renal function (eGFR) remained stable
- Urinary albumin-to-creatinine ratio (UACR) showed no further progression

Take home message

- **Glycemic remission is weight-dependent**
 - ✓ Sustained weight loss drives remission; weight regain reverses it.
- **Anti-obesity agents may need long-term maintenance**
 - ✓ GLP1 based medication effectively reversed regain and restored glycemic control in this patient.
- **Remission is not just about glucose**
 - ✓ Renal function remained stable with reduced proteinuria – a critical non-glycemic benefit.
 - ✓ Glucose-lowering and antihypertensive drugs were significantly reduced, improving adherence and QoL.
- **Metabolic surgery + timely adjunctive therapy offers sustained benefit**
 - ✓ Even when complete remission is not permanently maintained, metabolic and renal improvements persist.



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Thank you for your attention