

Transition from Severe Cancer Cachexia to Metabolic Recovery with Progressive Weight Gain Following a Structured Fasting-Based Dietary Pattern Combining One-Meal and Two-Meal Regimens: A PET-CT and Body Composition Correlated Case Report

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ABSTRACT

Cancer cachexia is a multifactorial metabolic syndrome characterized by progressive weight loss, skeletal muscle depletion, and systemic metabolic dysregulation. This case describes a young female with carcinoma of the hard palate who developed treatment-associated cachexia, with body weight declining from an initial range of 41–44 kg to approximately 37 kg following oncologic surgery in December 2023, and further decreasing to a nadir of ~34 kg, representing the most severe phase of cachexia.

The cachectic phase was associated with severe constipation, markedly reduced energy levels, and disruption of menstrual cycles.

A structured and monitored dietary protocol was implemented, beginning with an initial one-meal-a-day pattern, followed by a deliberate transition to a two-meal daily fasting-based regimen, consisting of an approximately 18-hour fasting period and an eating window of less than 6 hours (time-restricted feeding).

Adjunctive support included mitochondrial-targeted interventions (NMN and trigonelline) aimed at improving cellular energy metabolism, along with digestive enzyme supplementation to support gastrointestinal recovery and nutrient absorption.

Recovery was gradual, with energy improvement after ~39 kg, tissue healing after ~40 kg, and menstrual cycle restoration after ~45–48 kg.

The patient demonstrated a sustained improvement in body weight from ~34 kg to 52.3 kg over approximately two years (late 2023 to 2025), achieved in association with this structured and monitored intervention.

Comparative PET-CT imaging revealed initial high metabolic tumor activity (SUV 8.1) followed by complete metabolic resolution, with localized residual uptake (SUV 8.9) at the operative site, likely representing post-surgical inflammatory changes rather than persistent disease.

Body composition analysis confirmed increase in lean body mass and normal visceral fat, consistent with physiological recovery.

INTRODUCTION

Cancer cachexia is a complex metabolic syndrome associated with malignancy and characterized by progressive loss of body weight, skeletal muscle mass, and functional capacity. It results from reduced nutritional intake, tumor-driven metabolic alterations, and systemic inflammation.

Recovery from cachexia requires restoration of metabolic reserve, tissue healing capacity, and normalization of physiological functions including energy levels and endocrine balance.

This case highlights the clinical course of severe cachexia and its reversal in association with a structured fasting-based dietary protocol, supported by metabolic and digestive interventions.

CASE PRESENTATION

Young adult female diagnosed with carcinoma of the hard palate, treated with surgery, chemoradiation, and targeted therapy.

INVESTIGATIONS – PET-CT

Parameter	Baseline PET (April 2023)	Follow-up PET (Dec 2023)	Interpretation
Primary lesion	SUV 8.1	NIL	Complete resolution
Lymph nodes	SUV 1.2	NIL	Clearance
Operative site	Not present	SUV 8.9	Post-surgical inflammation/healing
Metastasis	None	None	No spread

CLINICAL INTERPRETATION

The metabolically active uptake at the operative site (SUV 8.9), observed in the immediate post-surgical period, is consistent with post-operative inflammation and tissue healing and should not be misinterpreted as residual or recurrent disease.

CLINICAL COURSE AND WEIGHT ANALYSIS

The patient's clinical course followed a clear sequential progression:

- Initial weight: 41–44 kg
- Post-surgery (Dec 2023): ~37 kg
- Further decline (cachexia nadir): ~34 kg

Cachexia Phase Features:

- Severe constipation
- Extremely low energy
- Loss of menstrual cycles

Weight Progression Table

Phase	Clinical Event	Weight
Baseline	Pre-treatment	41–44 kg
Post-surgery	December 2023	~37 kg
Severe cachexia	Nadir phase	~34 kg
Early recovery	Energy improvement begins	~39 kg
Healing phase	Tissue regeneration improves	>40 kg
Hormonal recovery	Menstrual cycles resume	45–48 kg
Stabilization	Final weight	52.3 kg

RECOVERY PHASE

Following initiation of a structured dietary intervention, the patient underwent a planned transition from a one-meal-a-day pattern to a two-meal daily fasting-based regimen, characterized by an approximately 18-hour fasting period and a restricted eating window of less than 6 hours.

This phase was additionally supported by:

- Mitochondrial support (NMN and trigonelline)
- Digestive enzyme supplementation, improving nutrient assimilation

Recovery occurred in a threshold-dependent manner:

- ~39 kg → Energy restoration begins
- >40 kg → Tissue healing improves
- 45–48 kg → Hormonal recovery (menstrual cycles resume)

The improvement from ~34 kg to 52.3 kg occurred over approximately two years (late 2023 to 2025).

BODY COMPOSITION ANALYSIS

Cachexia Stage (~37.6 kg)

- Low fat stores
- Reduced lean body mass

Recovery Stage (52.3 kg)

- Increased fat stores
- Lean body mass improved from 31.6 kg to 38.2 kg
- Visceral fat: Normal

This confirms true physiological recovery with muscle restoration, not pathological weight gain.

DISCUSSION

Systemic Recovery

- Gastrointestinal normalization
- Improved energy levels
- Hormonal restoration

Threshold-Based Physiology

- ~39 kg → Energy recovery
- >40 kg → Tissue healing
- 45–48 kg → Hormonal recovery

Role of Structured Two-Meal Pattern

The transition from a one-meal-a-day approach to a structured two-meal daily regimen within a time-

restricted feeding framework (18-hour fasting, <6-hour eating window) represents a critical component of the intervention.

This likely contributed to:

- Improved metabolic stability
- Enhanced nutrient distribution
- Better mitochondrial and hormonal support
- Sustained recovery without metabolic overload

Role of Mitochondrial and Digestive Support

- NMN and trigonelline may support mitochondrial energy production
- Digestive enzymes improve nutrient absorption during recovery

Nature of Weight Gain

- Subcutaneous fat restoration
- Normal visceral fat
- Physiological, not pathological

CLINICAL IMPLICATIONS

Weight restoration in cancer cachexia is a central determinant of physiological recovery.

- Supports tissue healing, energy recovery, and hormonal balance
- Recovery follows metabolic thresholds
- Combined dietary structure and metabolic support may enhance recovery outcomes

CONCLUSION

The patient experienced a decline from 41–44 kg to ~34 kg, followed by sustained recovery to 52.3 kg over approximately two years (late 2023 to 2025).

This recovery was associated with:

- Structured dietary transition (one meal → two meals)
- Defined fasting protocol (18-hour fasting, <6-hour eating window)
- Mitochondrial and digestive support
- Restoration of energy, tissue healing, and hormonal function

KEY CLINICAL MESSAGE

Recovery from severe cancer cachexia involves restoration of both body weight and systemic physiological function.

A sustained improvement from ~34 kg to 52.3 kg, supported by structured meal timing, defined fasting protocol, mitochondrial support, and digestive optimization, highlights a multifactorial and physiologically coherent approach to recovery, where weight gain represents a necessary and beneficial component of healing.