Case 2

Enteral nutrition on neuro-rehabilitation

Clinical summary

Presentation/clinical history

Mr J, 37 years, satellite technician

- Admitted to ICU 23 days ago with severe skull, left tibia and left humorous fractures following a fall from a first storey ladder.
- Intracranial epidural haematoma diagnosed and surgery completed to relieve pressure 20 days ago.
- A 8Fr Freka nasogastric (NG) tube in situ due to an induced coma and oral ventilation.
- Medical history: high cholesterol, hypertension, fibromyalgia
- Medications: statin, ibuprofen
- Biochemistry: previously low sodium due to fluid overloading with IV fluid on admission but all biochemistry now stable and within normal values. Na 144 mmol/l, K 4.5 mmol/l, Ur 5.8 mmol/l, Cr 92 µmol/l, Ca 2.21 mmol/l, PO_4 1.2 mmol/l, Mg 0.8 mmol/l

Weight history

Normal weight/ admission weight	108 kg (BMI: 36.1 kg/m²)
Weight on transfer to neuro-rehab	104.3 kg (BMI: 34.9 kg/m²)

- Weight loss: **3.4 %** – not significant

Tube feeding may reduce malnutrition risk in patients undergoing neuro-rehabilitation.[20]

Nutritional assessment

Estimated nutritional requirements

- Energy: 2503 kcal[5,6] (20 kcal x 104.3 kg + 1.2 stress factor due to trauma. No physical activity due to obesity)
- Protein: 104.3 g (1 g/kg)[5]
  (75 % actual body weight requirements due to obesity = 78.2 g)[21]
- Fluid: 2765 ml (using the 100/50/15 formula)[8]

Dietetic assessment

- Initially fed via NG tube in ICU with Fresubin Intensive and currently tolerating 1000 ml Fresubin 2 kcal HP Fibre at 75 ml/hr, however now in rehabilitation, nutritional requirements updated.
- Oral intake remains minimal approx. 400 kcal and 10 g protein – pureed diet and stage 3 (moderately thick) thickened fluids.
- Has catheter in situ – fluid balance good and draining good volumes approx. 2000 ml (with 2700 ml fluid input via NG tube through feed and medications and approx. 300 ml orally).
- Referred for PEG as likely to be feeding for a longer term – NG tube has been in for 3 weeks and oral intake remains minimal.

Aim

- Maintain nutritional status throughout rehabilitation and prevent catabolism.
- Also need to avoid over-feeding and meeting fluids requirements to maintain fluid balance. Aim for approx. 3000 ml as per previous fluid balance in ICU.

Tube feeding with Fresubin

Nutrition therapy

- A nutritionally complete feed is required to meet Mr J's requirements as likely to be consuming minimal micronutrients via oral diet.
- Fibre feed beneficial to maintain gut physiology.[13,14]
- Due to obesity, hypertension and high cholesterol, a feed with fish oil may provide some cardio protection benefits.[22]

Fresubin Original Fibre provides 30 g fibre in 2000 ml to maintain gut physiology.[13,14]

Day

Feeding regime

1. Fresubin Original Fibre 1500 ml at 100 ml/hr x 16 hr approx. 7 a.m.–11 p.m..
2. Fresubin Original Fibre 2000 ml at 125 ml/hr x 16 hr approx. 7 a.m.–11 p.m..
3. Fresubin Original Fibre 2000 ml at 150 ml/hr x approx. 13.5 hr (7 a.m.–8.30 p.m.) however due to EasyBag, feed can be stopped if required during rehabilitation.

Water flushes: 100 ml pre- and post-feed and 100 ml pre- and post-medications with at least 10 ml in between each medication. Providing 2000 kcal, 76 g protein, 30 g fibre and approx. 2780 ml fluid. Encouraged to maintain position at 30-degree angle to reduce aspiration risks.

Monitoring/follow-up

2 – Settled into the ward well. Feed tolerated well at 100 ml/hr, bowels moved 1 x and catheter in situ – draining well approx. 1800–2000 ml. Oral intake poor, needs assistance and maximum encouragement. Biochemistry stable. Review in 2 days.

4 – Feed currently running at 150 ml/hr. Improved tolerance with oral intake – no coughing. Speech also improving slowly. Physiotherapy continues and Mr J able to stand using stand aid. PEG tube insertion booked for 1 week. Weight 103.8 kg – slight reduction, not significant to change feed at present. Monitor again in 2–3 days.

7 – Oral intake approx. 500 kcal and 10 g protein – no significant changes. Feeding well tolerated at 150 ml/hr x 13.5 hr on Fresubin Original Fibre. Catheter draining approx. 2000 ml – no issues with fluid balance. Weight 104.1 kg – therefore stable and Mr J meeting nutritional requirements. All biochemistry within reference ranges. No changes – await PEG placement.

11 – PEG sited today with no complications. Feed to recommence after 3 hours on 2000 ml Fresubin Original Fibre at 150 ml/hr. Reviewed by speech and language therapist, lip seal improved and aspiration risk reduced, commenced stage 2 thickened (mildly thick) fluids and mince/mashed diet. Biochemistry remains within normal ranges. Monitor oral intake and weight.

14 – Rehabbing well, no problems reported with feed tolerance. Oral intake increasing slowly – approx. 900 kcal and 25 g protein therefore reduce feed to Fresubin Original Fibre 1500 ml at 150 ml/hr x 10 hr. Medication now changed to oral therefore increase water flushes to 100 ml pre- and post-feed and encourage with thickened fluid orally. If oral intake not adequate, need to give extra via tube. Catheter removed today – monitor urine output.

16 – Feeding continues on Fresubin Original Fibre 150 ml x 10 hr. Bowels moving well, urine output very good. Weight stable at 104.5 kg. Encouraged to trial Fresubin thickened ONS to aid oral intake. If Mr J can take Fresubin thickened ONS consistently and keep his weight stable, feed via tube can be reduced however he is likely to be tube-fed for a longer term.

Supplemental tube feeding with Fresubin Original Fibre combined with a mildy thick oral diet and texture modified Fresubin ONS helped Mr J to meet his nutritional requirements.

Therapeutic outcome

3 months post admission

- Rehabilitation successful – walking with minimal assistance (walking stick) and discharged home with carers to help with personal care.
- Oral intake improved and managing minced and moist diet with stage 1 (mildly thick) fluids and Fresubin thickened ONS 1–2 x daily.
- Tube remains in situ feeding 1000 ml Fresubin Original Fibre.
- Weight stable at approx. 105 kg, BMI 35 kg/m².
- 30 g fibre in 2000 ml Fresubin Original Fibre is beneficial to maintain gut physiology.[13,14]
- Micronutrients including vitamin D (20 µg in 1500 ml RDD) is essential to meet nutritional requirements. Due to 3 months' hospital stay and limited mobility, in the long term vitamin D may prevent fractures and falls.[15-18]
- A variety of containers sizes are flexible to meet the need of patient during rehabilitation.