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## Case Report


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# Effect of Nutritional Therapy on Superior Mesenteric Artery Syndrome – A Case Report



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## ABSTRACT

Superior Mesenteric Artery (SMA) syndrome is a rare cause of upper gastrointestinal obstruction. Rapid weight loss can be implicated in this syndrome. Timely intervention of nutritional support prevents malnutrition and its related problems. This case report details the role of dietician and the nutrition support provided to the patient. SMA syndrome was successfully treated in this case with nutritional therapy avoiding surgical intervention.



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## **INTRODUCTION**

Superior mesenteric artery (SMA) syndrome or Wilkies Syndrome is a rare form of acquired disorder in which acute angulation of the SMA causes compression of the third part of the duodenum between SMA and aorta leading to gastrointestinal obstruction. Loss of fatty tissue around SMA is believed to be possible causative factor leading to acute angulation. This acute angulation causes rapid weight loss and malnutrition in patient with SMA syndrome.

The most common symptoms are usually abdominal pain (chronic, intermittent or acute) and often associated with nausea and bilious vomiting. The severity of the symptoms depends on the aorta mesenteric angulation. "Food fear" is commonly seen among patients with the chronic form of SMA syndrome. The most common reason for food fear in SMA syndrome patients are often regurgitation of food, leading to rapid weight loss.

Imaging studies performed to confirm SMA Syndrome are barium study of upper gastrointestinal scopy, color Doppler ultrasonography, computerized tomography (CT) or Magnetic resonance angiography (MRA) of abdomen.

The preferred treatment modality of SMA syndrome is usually conservative management while the other alternative is surgical management. SMA syndrome can be successfully treated by aggressive nutritional management. This may include total parenteral nutrition (TPN) or enteral feeding by a Nasojejunal (NJ) tube. As part of conservative management, dietician is involved in the first line of management by the medical team to deliver nutritional support to the patient. The prime objective of the dietician is to plan a specific nutritional care plan based on nutritional assessment carried out on the patient. Once NCP is planned, the next step will be the implementation of enteral nutrition. This allows the patient to improve the nutritional deficit. The ultimate goal of the dietician is to significantly achieve optimum nutritional status through enteral nutrition and achieve weight gain.

## **CASE REPORT:**

A 16 year old boy was admitted with history of significant weight loss of 57 kg from 114 kg to 57 kg in the preceding seven months with complaints of abdominal pain, distension and vomiting. He was apparently well ten days ago when he developed sudden onset epigastric pain which had worsened with food intake. This was associated with multiple episodes of immediate postprandial vomiting which was bilious in nature and non-blood stained. He also

had upper abdominal distension which was non-progressive and was relieved after insertion of a Ryle's tube at a local hospital elsewhere. He was referred to our hospital for further management. He was evaluated and a possible diagnosis for SMA was considered owing to his sudden loss of weight. The significant weight loss over a period of seven months was due to intentional dieting (starving) and vigorous exercise. He was administered intravenous fluid maintenance and encouraged to take liquids orally. Following initial stabilization, he was evaluated by the Gastroenterologist and a nasojejun tube was placed. The patient was then referred to dietician for appropriate nutritional support.

### NUTRITION ASSESSMENT

Anthropometric assessment of the patient was done which revealed a massive weight loss of about 50% over a period seven months. Anthropometric data is shown in Table 1.

**Table 1 – Anthropometric Data**

| Parameter                     | Measurement             |
|-------------------------------|-------------------------|
| Height                        | 175 cm                  |
| Weight                        | 57 kg                   |
| Weight loss                   | 57 kg in 7 months       |
| Desirable Weight (for height) | 64kg                    |
| BMI                           | 18. 3 kg/m <sup>2</sup> |

### NUTRITION CARE PLAN

24 hour recall revealed poor oral liquid intake of less than 300 kcal. The primary nutritional goals were to provide adequate nutritional support through nasojejunal (NJ) tube by providing 600 Kcal and 20 gms of protein through home based jejunostomy (jej) formula feeds. Gradual stepping up / stepping down of nutrients was planned based on the tolerance.

### IMPLEMENTATION OF NUTRITIONAL CARE PLAN

Home based jejunostomy formula feed was administered through NJ as planned by the dietician. Continuous NJ feed was started at the rate of 25ml /hr (600 ml & 600 Kcal & 20 gm of protein)for the first two days. Since the patient tolerated the feed well, the dietician increased the NJ feed volume at the rate of 50 ml/hr (1200 ml & 1200 cal & 40 gm protein) for the 3<sup>rd</sup> day. On the 5<sup>th</sup> day, continuous NJ feed was changed to bolus NJ feed at the rate

of 150 ml / 2 hr (1800 ml; 1800cal & 60 gm protein). Since there was no appreciable weight gain, rescheduling of NJ plan was done on the 7<sup>th</sup> day to 200 ml / 1 ½ hours (2400ml & 2200 cal& 80gm protein) (12 feeds a day) which continued till 14<sup>th</sup>day. A weight gain of 1 kg was achieved on the 14<sup>th</sup> day. On the 15<sup>th</sup> day, without increasing the volume of the NJ feeds, energy and protein was increased by changing the composition of the feed (2400ml & 2400cal & 90gm protein) which was continued for the next 15 days. At the end of one month, patient could gain 4 kg of body weight. In addition to the NJ feed, micronutrient supplement was prescribed by the Physician to correct the nutritional deficit.

SMA syndrome patients, following a substantial weight loss due to inadequate intake, are at the risk of developing Refeeding syndrome. Hence NJ feed was started slowly. Very severely malnourished patients are vulnerable to lethal electrolyte and fluid shifts following aggressive nutritional support therapy. Keeping this into consideration the patient was administered with smaller volume of NJ feeds and stepped up gradually. Daily close monitoring was done by the dietician. Trial oral clear fluids were also given along with NJ feed such as clear soups, tender coconut water, clear fruit juice, dhal water etc which was well tolerated. Since there were no complications observed (abdominal pain & vomiting), smaller quantities of soft solid diet was initiated along with NJ feed by the dietician. Once the patient started tolerating the oral diet well, slowly NJ feed was tapered and NJ feed was completely stopped on the 21<sup>st</sup> day and NJ tube was removed. Grading up of nutrients is shown in table 2.

**Table 2: Grading up of energy and protein**

| Days           | 1   | 2   | 3-4  | 5-6  | 7-14 | 15-20 | 21 <sup>st</sup> to 30 <sup>th</sup> (till discharge) |
|----------------|-----|-----|------|------|------|-------|---|
| Volume         | 600 | 600 | 1200 | 1800 | 2400 | 2400  | Soft Solid Diet                                       |
| Energy (k.cal) | 600 | 600 | 1200 | 1800 | 2200 | 2400  | 2500  |
| Protein(gm)    | 20  | 20  | 40   | 60   | 80   | 90    | 90  |

**DISCUSSION**

When the patient was handed over for nutritional support to the dietician, the MNT goal was to initiate adequate nutrients via NJ tube to prevent weight loss keeping in consideration on the 50% weight loss over a period of seven months. Home based NJ feeds was started at a smaller volume due to severe malnutrition and abdominal pain to prevent refeeding syndrome. The primary goal was to meet the RDA for age. He was started on NJ feed

consisting of rice flour, coconut oil, sugar, commercial protein supplement at proper composition to deliver adequate energy and protein. Stepping up of nutrients was gradually done based on the tolerance. Since the patient tolerated the feed well, trial of clear liquids, full liquid and soft solid diet was tried along with NJ feeds. He did not have any abdominal pain and vomiting. NJ feed was removed on the 21<sup>st</sup> day and patient was started on high calorie, high protein soft oral diet till discharge. At the time of discharge, he was hemodynamically stable and energetic. He gained 4 kg of weight in 4 weeks through the nutritional support provided and was consuming oral diet without any food fear. He was advised to come for a follow-up after 3 months. During follow-up, he was found to have 6 kg of weight post discharge.

## CONCLUSION

SMA syndrome is a rare problem that affects patients with substantial weight loss. SMA syndrome was successfully treated in this case with nutritional therapy avoiding surgical intervention. Nutrition therapy should be carefully planned for SMA syndrome patients and titration of calorie and protein requirement should commence gradually based on the tolerance of SMA syndrome patient. Dieticians play a very important role in providing nutrition therapy and close monitoring by the dietician in such cases is deemed mandatory.

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