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ORIGINAL CONTRIBUTIONS

How Effective Is the Multidisciplinary Team Approach in Bariatric Surgery?

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Abstract

Background Multidisciplinary team (MDT) meetings are widely recommended in the management of bariatric surgery patients; however, there is limited evidence for their effectiveness. The aims of this study were to evaluate the decision-making process of a single-day bariatric MDT clinic and secondly to evaluate whether these MDT decisions were implemented.

Methods This was a retrospective observational study analysing MDT treatment decisions from February 2012 to June 2013 using an MDT proforma. The decision-making process of the MDT meeting was investigated by assessing the alterations in management plan between the surgeon and the rest of the MDT. Adherence to MDT decisions was also assessed.

Results Decisions regarding 200 consecutive patients were analyzed. There was MDT agreement for 55%, and patients were listed for surgery on the day of the MDT. There was MDT disagreement regarding 45%, with conflicting opinions expressed by surgeons in 33/200 (17%), anaesthetists in 60/200 (30%) and dieticians in 65/200 (33%). The MDT plan was instigated in 78% and the most common reason for failure was patients failing to attend for further assessment. By the end of the study, 85% of patients underwent bariatric surgery, 11.5% declined further input, 2.5% chose further weight loss and 1% were removed from waiting list.

Conclusion Use of a single-day MDT clinic format resulted in a change in plan for a significant number of patients. This can be interpreted as improved quality of care for these patients, and we conclude the MDT approach is valuable.

Keywords Bariatric surgery · Multidisciplinary team meeting

Introduction

A multidisciplinary team (MDT) consists of healthcare professionals from different disciplines who offer their specific skillset and contribute to the best care for each individual patient [1]. Current literature provides evidence that MDT meetings lead to significant changes in the way cancer patients are managed [2] leading to more favourable outcomes [3–8]. In some cases, patient management plans were changed in up to 70% of patients' post multidisciplinary discussion [9]. A multidisciplinary approach is key to the management of rectal cancer patients leading to improved oncological outcomes [10]. Evidence for similar MDT benefits is lacking in bariatric surgery.

A large body of evidence confirms the efficacy of bariatric surgery and its effect on obesity related comorbidity [11, 12]. The patients often have complex medical and social issues, which are difficult for a surgeon alone to manage. Previously,

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comorbidities were often undiagnosed prior to bariatric surgery, placing patients at increased risk especially as up to 82.1% of patients have at least one comorbidity [13, 14]. Guidelines produced by NICE (https://www.nice.org.uk/guidance/cg189) (National Institute for Clinical Excellence) and EAES [15] (European Association for Endoscopic Surgery) recommend bariatric surgery should be undertaken only by a multidisciplinary team that can provide appropriate pre-operative assessment, dietetic input and psychological support. It is also suggested that mental health professionals should play a role in the evaluation of these patients [16]. The MDT should also take account of the patient's views, preferences and circumstances and help them choose the most appropriate operation for them [17, 18]. In the cancer surgery setting, consideration of patient preferences is associated with better MDT decision implementation rates [19, 20].

Few hospitals have a single-day bariatric multidisciplinary clinic. From the patient's perspective, a single-day multidisciplinary clinic visit is less stressful and more convenient than multiple visits to physicians of different specialties [21]. The single day format may improve patient education and facilitate less confusion regarding the therapeutic plan [22].

The aims of this study were to evaluate the decision-making process of a single-day bariatric MDT clinic and secondly to evaluate whether these MDT decisions were implemented.

Methods

In the UK, patients being treated under the National Health Service follow a pathway towards bariatric surgery mandated by the National Institute for Health and Care (https://www.nice.org.uk/guidance/cg189). All patients are referred from their Primary Health Care/General Practitioner to a Weight Management Clinic (WMC) run by an Obesity Physician for a period of 6 to 12 months. At the WMC, patients undergo assessment and optimisation of comorbidities such as diabetes and obstructive sleep apnoea; dietary and exercise assessment, education and intervention; and psychological screening and intervention, if indicated. Once judged as ready for surgical assessment, they are then referred to the Surgical Assessment MDT Clinic.

The Royal Cornwall Hospital has a well-established single-day bariatric MDT clinic. The key members of the MDT included the surgeon, anaesthetist, dietician, psychologist and specialist bariatric nurse. Patients were assessed by all members of the MDT and underwent detailed discussions regarding options for surgery, risks and benefits. All cases were subsequently presented at a multidisciplinary conference, and a consensus recommendation was agreed. Patients were then informed of the decision by post. If a sub-specialty consultation was required, patients had to return later for an additional appointment.

This was a retrospective observational study analysing all MDT treatment decisions for 200 consecutive patients. For this type of study, formal ethical approval is not required. A standardized MDT proforma was completed prospectively by the surgeon at the conclusion of each MDT meeting to record assessment and treatment decisions. Baseline data recorded for all patients included age, sex, BMI and comorbidities. The decision-making process of the MDT meeting was investigated by assessing the alterations in management plan between the surgeon and the rest of the MDT. It was assumed that all patients referred to the MDT by a physician-led weight management service were deemed ready for bariatric surgery. Adherence to the MDT decisions was also assessed. Patients were eligible for surgery if they had a body mass index (BMI) of 40 kg/m^2 or higher or a BMI between 35 and 40 kg/m^2 and significant comorbidities. Case notes were also reviewed for data on operative procedure, mortality and morbidity.

Results

Consecutive treatment decisions regarding 200 patients were analyzed. The average BMI was 46.9. Patient demographic data are summarized in Table 1. All MDT meetings were attended by at least one surgeon, anaesthetist and dietitian.

These patients were all referred to the MDT on the premise that they were ready for surgery by the weight management physicians. The most common comorbidities reported are presented in Table 2.

Following discussion, there was MDT agreement for 109 patients (55%) and patients were listed for surgery on the day of the MDT. There was disagreement regarding 91 patients (45%), with conflicting opinions expressed by at least one MDT member: by surgeons in 33 patients (17%), anaesthetists in 60 patients (30%) of cases and dietitians in 65 patients (33%) (Fig. 1).

Of the 33 patients deemed not ready for surgery by the surgeon, 25 further investigations were required. These were CT in 6 to rule out liver disease (5 were normal and 1 had a benign soft tissue mass), ultrasound in 2 patients (1 was normal, 1 showed gallstones and patient had pre-operative

Table 1 Pre-operative patient demographic data

Characteristic	Mean	Range
Age	48	23–60
Gender:		
Male	$n = 35$	
Female	$n = 165$	
BMI	46.9	35.0–68.7
De Maria Score	1.4	0–4.0

Table 2 Pre-operative comorbidities

Preoperative comorbidity	Number of patients (%)
Type 2 diabetes	61 (30.5)
Hypertension	59 (29.5)
Dyslipidaemia	29 (14.5)
Obstructive sleep apnoea	47 (23.5)
Gastro-oesophageal reflux disease	49 (24.5)
Osteoarthritis	47 (23.5)
Asthma	46 (23.0)

cholecystectomy) and 12 required gastroscopy for reflux or anaemia (findings were 6 normal, 1 hiatus hernia, 1 oesophagitis and gastric antral vascular ectasia requiring pre-operative argon therapy, 1 oesophageal adenocarcinoma, 1 was abandoned and subsequent barium swallow normal and 1 was not performed.) Doppler ultrasonography to rule out venous thrombosis was performed in 3 and one had a colonoscopy in iron deficiency anaemia revealing benign polyps. Further weight loss was advised in patients whose BMI was more than 60. Figure 2 shows a summary of recommendations.

The anaesthetist requested further investigation or consultation in 60 patients. This included an additional speciality opinion in 18 patients (7 by cardiology, 5 endocrine/diabetes teams, 3 haematology and 1 renal, 1 respiratory and 1 neurology). In total, 57 further investigations were required (Fig. 3). The most common of these were sleep studies or cardiopulmonary investigations; others were cervical spine x-rays, carotid Doppler ultrasonography and 24 h blood pressure monitoring. Pre-operative CPAP was required in 12 patients. Further dietetic input was recommended for 65 patients to enable further weight loss or patient education. It was recommended that 4 patients (2%) have further been reviewed by a psychologist. The MDT recommended the use of a high dependency bed for 73 patients (36.5%) of which 55 (27.5%) actually required a bed.

The MDT plan was instigated in 156 patients (78%). The most common reason for non-implementation was patients failing to attend either investigation or further education (DNA = 21). Secondly, 12 patients chose an alternative bariatric surgery operation to that decided upon when assessed. Seven patients opted for further long-term weight loss, 1 patient did not undergo a recommended gastroscopy, 1 patient was not discussed in an additional complex cases MDT and 1 patient was diagnosed with oesophageal cancer during work up for surgery (Fig. 4).

The actual outcomes of the patients at the time of study are shown in Fig. 5. No patients passed through the MDT and were declined surgery outright. The number of patients that underwent bariatric surgery was 170 (85%), 23 patients (11.5%) withdrew from surgery or did not attend their appointments, 5 patients (2.5%) opted for further weight loss, 1 patient was referred on to another centre and 1 patient was diagnosed with oesophageal carcinoma and was subsequently removed from the bariatric waiting list. Of those undergoing bariatric surgery, 128 (75.3%) had a Roux-en-Y gastric bypass, 28 (16.5%) had a gastric band and 14 (8.2%) had a sleeve gastrectomy.

The incidence of complications was low with readmission rate 6% (12 patients) (Table 3). The rate of re-laparoscopy was 3.5% (7 patients) but only 2 patients were found to have complications; hence, the re-operation rate was 1.2%. Of these, one patient had obstruction at the jejunojejunostomy requiring the anastomosis to be re-fashioned and one had a staple line

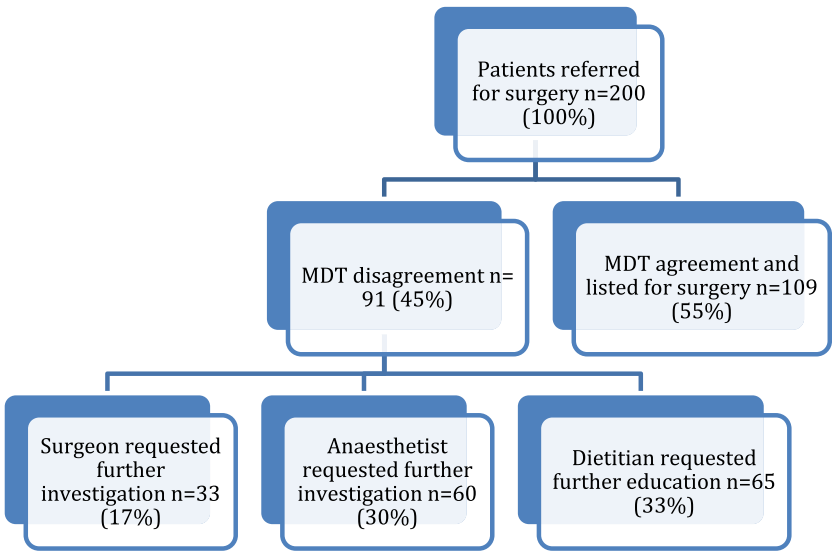

Fig. 1 Patient outcomes following MDT discussion—of note, some patients were deemed not ready for surgery by more than one MDT member

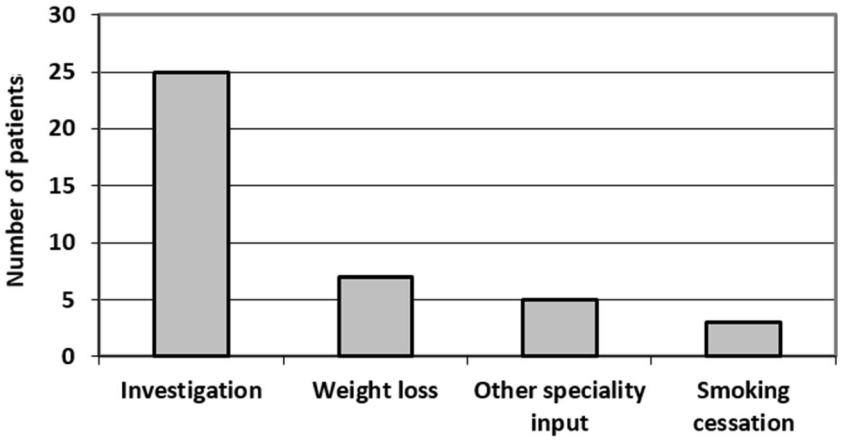

Fig. 2 Recommendations made by the surgeon

leak from the remnant stomach requiring drainage and parenteral nutrition. Both these complications were managed laparoscopically. One patient with dysphagia was found on gastroscopy to have oesophageal oedema which was managed conservatively.

Discussion

Although the use of MDTs is widely recommended for bariatric surgery [23], evidence of their effectiveness is lacking. To our knowledge, this is the first study analysing the impact of a single-day bariatric MDT clinic and the subsequent effect upon bariatric surgery patients. Previous studies have discussed the best way to evaluate the effectiveness of an MDT meeting in non-bariatric surgery settings [2, 24]. Measures considered include adherence to guidelines [25], the proportion of patients that had change to diagnoses or diagnostic imaging reports and the proportion of patients referred to other specialities [26]. Monitoring implementation of the MDT plan has also been suggested to be an informative way of evaluating the MDT [19, 24]. In this study, we chose to assess the effectiveness of the MDT in two ways: first, by looking at deviations from a direct pathway towards surgery initiated by non-surgeon members of the MDT. This allows comparison of the MDT approach against the alternative of a traditional "surgeon-only" decision-making pathway. Secondly, by looking at subsequent adherence rates with MDT-recommended pathway decisions.

This study demonstrated that the MDT approach resulted in a deviation from an uninterrupted pathway towards surgery for a significant number of patients (45%). For the majority of patients, this decision was initiated by a non-surgeon MDT member. The leading such reasons for a recommended change in the surgical pathway were for further dietary education, closely followed by further investigations requested by an anaesthetist. Compared with the traditional approach of surgeons alone making decisions regarding readiness for surgery, this can be interpreted as an improvement in the quality of care for these patients resulting from the MDT approach. This interpretation relies upon the assumption that further dietary input and/or pre-operative testing and treatment result in improved outcomes for patients. Previous studies have been supportive of this assumption, demonstrating that anaesthetic pre-assessment of bariatric patients has been shown to reduce ICU admissions [27] and that lifestyle interventions lead to improved weight loss and maintenance [28]. Discussion at a bariatric MDT has also been shown to reduce the post-operative complication rate [29].

It is possible that the organization of our practice may have attenuated the MDT effects observed by this study; all patients were referred from a physician-led WMC experienced in

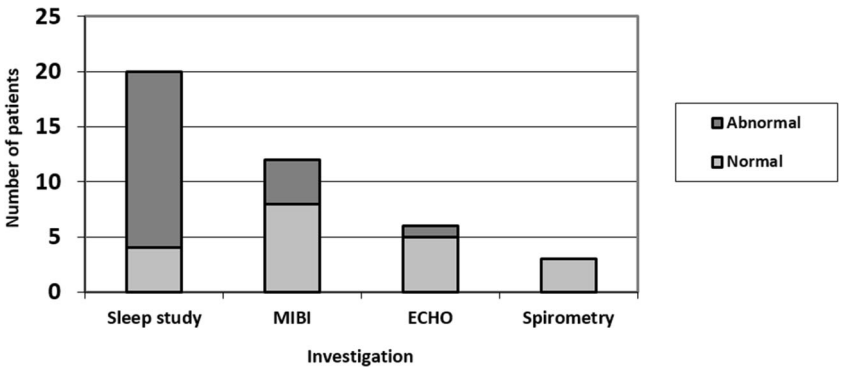

Fig. 3 Most common further investigations requested by the anaesthetist

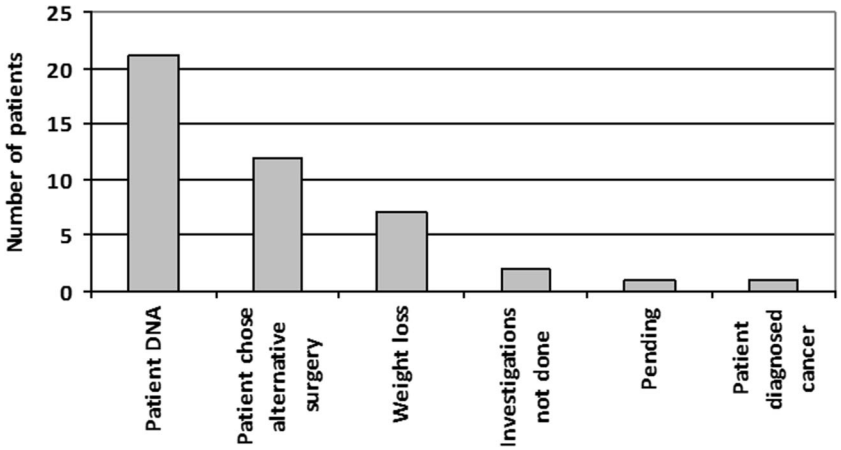

Fig. 4 Reasons for MDT plan not being implemented

undertaking appropriate investigations prior to referral for surgery. Without this pre-referral screening, the value of the MDT may be further enhanced.

Conversely, a study by Rebibo et al. [29] has reported 77.8% of patients discussed at bariatric MDT proceeded straight to surgery, compared with 55% in our study. In their study, all patients underwent a gastroscopy (compared with 6% in this study) and lung function tests (compared with 3%) prior to MDT referral, and they did not report the presence at all meetings of an anaesthetist who may be more discerning regarding cardiovascular screening. We perform such investigations only when indicated for individual patients; this is standard in more financially constrained UK practice. Whilst this approach may appear to be more cost-effective, this was not examined in the study.

Seventy-five percent of our patients underwent a RYGB. This reflects longstanding preferences amongst our patient population for RYGB. Three bariatric procedures were offered: gastric banding, RYGB and sleeve gastrectomy. Selection of operation was made by the patient following education and discussion of the relative merits of these procedures. A small number of patients had their options restricted if there were clinical reasons such as cirrhosis or severe gastro-oesophageal reflux disease. More recently, we have seen a change in patient preferences towards sleeve gastrectomy.

There was a larger than anticipated rate of patients withdrawing from surgery (14%) which is more significant than previously reported rates of 1% [29]. This was for a combination of reasons including improved weight loss with conservative measures and patients changing their mind about having bariatric surgery. It is unclear if this is attributable to an MDT approach.

In this study, the MDT plan was not implemented in 22%, which does not compare well with 10–15% non-adherence rates previously reported for cancer MDTs [19, 30]. The predominant reason for non-implementation was patients failing to attend follow-up appointments and/or investigations (21 patients). Such patient drop out would be unusual in the cancer surgery setting, where patient motivation to attend investigations and follow-up is perhaps more pressing. Previous studies [31] of cancer MDT meetings have described failure to appreciate comorbidities as a major reason for failure to implement the recommendations of MDT meetings. In this study, the converse may be true—with a greater appreciation of possible comorbidities stimulating further investigations, which patients subsequently decline to undergo. Bariatric surgery MDT meetings are perhaps more likely to consider comorbidities than cancer MDTs as they include anaesthetists as core members with a primary role of identifying and assessing comorbidities.

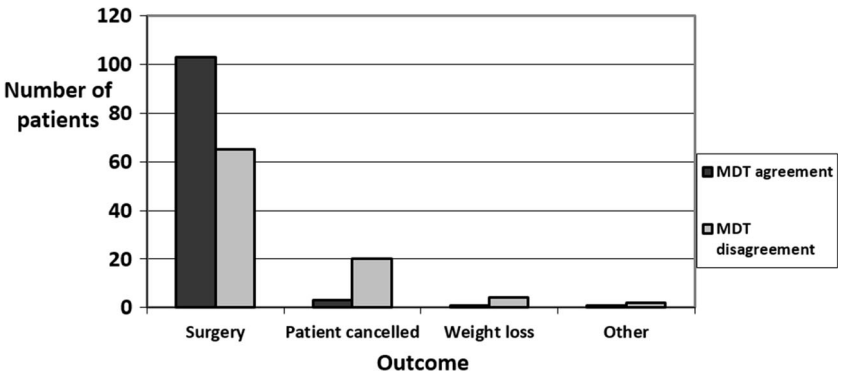

Fig. 5 Final outcomes at time of study

Table 3 Complications

Complication	*n* (%)
Wound infection/haematoma	11 (5.5)
Pain/vomiting	9 (4.5)
Bleed	2 (1)
Oesophageal oedema	1 (0.5)
Obstruction	1 (0.5)
Leak from remnant stomach	1 (0.5)

The second most frequent reason for the MDT decision not being implemented was because patients changed their mind about which bariatric procedure to undergo (12 patients). This situation is less likely in cancer surgery where disease stage and reconstructive requirements dictate choice of operation rather than patient preference. Whether the rate of patients changing their choice of operation is attributable to the MDT process is unclear. However, it seems likely that the information and education delivered to patients during the MDT process would be a major influence upon patient decision-making. This could be interpreted as a benefit resulting from the MDT process rather than a criticism of its effectiveness. There is evidence to support that enhancing patient choice leads to better post-operative compliance and improved rates of weight loss [32].

Obesity surgery guidelines suggest the patient must be seen pre-operatively by a surgeon, anaesthetist and dietician [15]. A national survey of bariatric surgeons in America to assess standard practice showed that although 93% used a multidisciplinary team, only 53% had one with all the members recommended above [33]. Surprisingly, increased surgeon experience was associated with decreased use of the MDT [33]. In addition to the above, psychological evaluation is necessary only for selected patients. We have reported a 100% attendance of a surgeon, anaesthetist and dietician at the MDT meeting, allowing for an accurate assessment of MDT effectiveness.

Running an MDT has significant organizational and management demands raising the question, do all patients need MDT discussion? Chinai et al. reported that the colorectal cancer MDT meeting had very little clinical impact and was very expensive [34]. Current evidence is insufficient to determine whether MDT implementation is cost-effective or not in secondary care of cancer patients [35] and there is some evidence that in colorectal cancer, MDT delays treatment [36].

In this study, we have demonstrated that the MDT resulted in changes to the treatment pathway for a significant (45%) proportion of patients and can be considered beneficial in ensuring that such patients undergo essential investigation and optimisation of comorbidities, which may not have been apparent in a non-MDT setting. This study has also demonstrated that the MDT results in delays to treatment as many (90 patients) were required to undergo further investigations, assessment or interventions. However, bariatric surgery differs from cancer therapy in that delaying surgery may result in improved outcomes rather than the opposite.

The limitations of this study include the retrospective review of the data. It can be difficult to evaluate the influence of MDTs on quality of care as has been discussed above. In addition, the current study lacked information on patient evaluation and satisfaction with the single-day multidisciplinary clinic, which would have been useful. Another potential flaw is the absence of a control group, i.e. outcomes of patients not discussed at MDT meeting. However, since MDT discussion is mandated for all UK NHS patients (https://www.nice.org.uk/guidance/cg189), the use of a control group was not possible.

In conclusion, use of a single-day MDT clinic format resulted in a change in decision for a significant number of patients (45%). This can be interpreted as improved quality of care for these patients. From this retrospective study, we conclude that the MDT approach is valuable but we would suggest that prospective studies may further evaluate and improve the effectiveness of MDT meeting implementation in bariatric surgery.

Compliance with Ethical Standards

Conflict of Interest All authors (N. L Bullen, J. Parmar, J. Gilbert, M. Clarke, A. Cota, I. G. Finlay) are employees at the affiliated hospital and declare that there is no conflict of interest in the findings of this paper.

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