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SIMULTANEOUS DEBULKING OF GREAT OMENTUM LIKE A PALLIATIVE STAGE OF METABOLIC SYNDROM AND OBESITY TREATMENT

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Summary

The article discusses the possibility and expediency of simultaneous visceral fat debulking (omentectomy) in patients with metabolic syndrome and obesity. The investigation of the level index HOMA in the pre- and postoperative period in 50 patients with metabolic syndrome and obesity. Of these various 25 performed abdominal surgery, the rest of the 25 performed similar operations with simultaneous omentectomy. Results indicate that the greater omentum debulking affect carbohydrate metabolism by reducing the severity of insulin resistance and hyperinsulinemia.

Key words: debulking, greater omentum, metabolic syndrome, obesity, simultaneous surgery.

СИМУЛЬТАННЫЙ ДЕБАЛКИНГ БОЛЬШОГО САЛЬНИКА КАК ПАЛЛИАТИВНЫЙ ЭТАП ЛЕЧЕНИЯ МЕТАБОЛИЧЕСКОГО СИНДРОМА И ОЖИРЕНИЯ

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Резюме

В статье обсуждаются вопросы возможности и целесообразности применения симультанного дебалкинга висцеральной жировой ткани в виде оментэктомии у пациентов с метаболическим синдромом и ожирением. Проведено исследование уровня индекса НОМА в до- и послеоперационном периоде у 50 пациентов с метаболическим синдромом и ожирением. У 25 пациентов выполнены различные абдоминальные операции, у остальных – подобные операции с симультанной оментэктомией. Результаты указывают на то, что дебалкинг большого сальника влияет на углеводный обмен за счет снижения выраженности гиперинсулинемии и инсулинорезистентности.

Ключевые слова: дебалкинг, большой сальник, метаболический синдром, ожирение, симультанная хирургия.

СИМУЛЬТАННИЙ ДЕБАЛКІНГ ЧЕПЦЯ ЯК ПАЛІАТИВНИЙ ЕТАП ЛІКУВАННЯ МЕТАБОЛІЧНОГО СИНДРОМУ І ОЖИРІННЯ

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Резюме

У статті обговорюються питання можливості і доцільності застосування симультанного дебалкінга вісцеральної жирової тканини у вигляді оментектомії у пацієнтів з метаболічним синдромом та ожирінням. Проведено дослідження рівня індексу НОМА в до- і післяопераційному періоді у 50 пацієнтів з метаболічним синдромом та ожирінням. У 25 пацієнтів виконані різні абдомінальні операції, у інших – подібні операції з симультанною оментектомією. Результати вказують на те, що дебалкінг великого чепця впливає на вуглеводний обмін за рахунок зниження вираженості гіперінсулінемії і інсулінорезистентності.

Ключові слова: дебалкінг, великий чепець, метаболічний синдром, ожиріння, симультанна хірургія.

The problem of treatment of the metabolic syndrome (MS) and obesity (O) in the last decade has become particularly relevant because the prevalence of this disease has reached pandemic level, and the level of disability and mortality of patients so large that violate state demographics, dramatically increase the social and individual health care costs [1, 2].

Poor efficiency of conservative therapy of MS and O, its low compliance, short-term effect resulted in the rapid development of metabolic (bariatric) surgery, which is preferred for the treatment of pronounced, severe forms of the disease. Bariatric surgery is highlighted in a separate line, available in 2 English-language specialty surgical journal: obesity surgery and surgery for obesity and related disease. It is proved that only surgical treatment provides reliable, long-term results, can eliminate or significantly reduce the severity of hyperinsulinemia and insulin resistance. Thus, when the gastric bypass surgery in patients with diabetes, mortality was 92% lower than the Diabetes than conservative therapy of this disease [3, 4, 5]. However, in many European countries and, in particular, in Ukraine the

percentage of the bariatric surgery is extremely low. So according to hospital surgery and proctology DZ "ZMAPO Ministry of Health of Ukraine" percentage of bariatric operations amounted to only 2.2% of the required (63 operations for 2 years). While in Canada (Ontario Surgical Clinic) for 2012–2013. performed 5989 operations, and in 2014 pre-registration for the operation amounted to more than 2 thousand.). This is due to a lack of awareness of the opportunities and benefits of metabolic surgery, and the lack of state standards in the treatment of MS and G, as well as the low patients financial possibilities in need of self-payment for provide the therapy.

Under these conditions, there is the feasibility of changing the vector operations from single to simultaneous, and, if it is impossible to carry out a radical intervention to implement a palliative. However, these problems have hardly been studied. Most studies devoted to issues omentectomy conducted simultaneous with bariatric surgery [6, 7, 8], but not at the planned operations on the abdominal organs and pelvis in patients with MS and O.

Therefore, the **aim** of the work was: to determine the appropriateness of performing simultaneous debulking of greater omentum and its place in the treatment of metabolic syndrome and obesity.

Material and Methods: The study involved 50 patients surgical hospital with MS and O. Patients underwent clinical, anthropometric, biochemical studies in compliance with the criteria for obesity and metabolic syndrome. Exclusion criteria were the presence of type 2 diabetes. In addition to the determined and postoperative levels of glucose and insulin in blood plasma. About the state of insulin resistance was judged on the basis of the index HOMA – IR. Abdominal obesity is determined by measuring waist circumference (normally less than 88 cm in women, in men less than 102 cm). Patients were divided into two groups. The first formed 25 people with MS and about who underwent abdominal and/or small pelvis was performed. The second consisted of 25 people with MS and O, which after the main phase made of a similar standard Simultaneous omentektomy. Statistical analysis was performed by methods parametric and non-parametric statistics using Statistical software application with the calculation of the arithmetic mean and standard deviation, t-test for normally distributed variables, the Mann-Whitney test for nonparametric measurements. A significant difference was considered indicators at $p < 0.05$.

Results and discussion. Comparative analysis of the age, weight, height of the patient, gender, nature and characteristics of the basic operations (cholecystectomy, hernia repair, surgery on the uterus and appendages) revealed no between groups of any significant differences.

Justification of greater omentum debulking in MS and O patients, based on data about: a metabolic aggressive visceral fat [9]; the positive effect of reducing the mass of visceral fat on the state of glycemic profile [10]. It is logical to assume that the final clinical effect of decreasing visceral fat mass (in particular greater omentum) is independent of the way in which this reduction is achieved: by diet and physical activity, pharmacological (using drugs to reduce body weight) or by surgical debulking.

Of course, the question of the appropriateness of the debulking should be taken individually, but when possible (duration of the operation, the patient, the surgeon's qualifications, etc.) omentum debulking should be a mandatory step for any simultaneous surgical treatment of patients with obesity and metabolic syndrome no matter which way the operation is performed: laparotomy or laparoscopy.

The research status of glycemic profile before and after simultaneous debulking greater omentum during operations on the abdominal organs and pelvis showed the results presented in

Table 1

Status of carbohydrate metabolism in patients with MS and O pre- and post - simultaneous greater omentum debulking

	Glucose (mmol / l)		Insulin (mkIE / ml)		HOMA-IR index	
	Pre op.	Post op.	Pre op.	Post op.	Pre op.	Post op.
1 group n = 25	4.79±0,54	4.87±0,59	21.26±4,92	20.59±3,3	4.57±1,22	4.52±1,11
2 group n = 25	5.23±0,65	4.70±0,51	21.49±5,32	13.70±2,34 p ₁ <0,001 p ₂ <0,001	4.21±1,37	2.38±0,49 p ₁ <0,001 p ₂ <0,001

p₁ – differences between those of groups 1 and 2;

p₂ – the difference between the indices of the same group before and after surgery

The results showed that the average level of glucose in both groups and to - and postoperative fit standard indicators.

Study of insulin showed that its physiological values in group 1 patients in the preoperative period were observed in 60% of cases. A hyperinsulinemia observed respectively

in 40% of cases. Moreover, fluctuation of excess insulin is in the range 0.8% – 17.3%. Thus, a normal level of glucose is not yet testifies to the absence of hyperinsulinemia.

In the second group in the preoperative period the average level of insulin in patients (21.49 mkIE / ml) corresponds to the normal parameters. However, detailed analysis showed that only 56% of patients insulin corresponded to physiological values. The remaining 44% of patients with its performance exceeded the upper threshold of the norm of 1.2% – 18.4%, i.e. there was a hyperinsulinemia. Despite the fact that these figures are not critical, they indicate the same load on the pancreas insular apparatus. And in the absence of information on the duration of the state of hyperinsulinemia to draw conclusions about the impact of these biochemical changes in the body it is not possible.

Study of insulin resistance index in the first group showed that when glucose levels are exceeding the upper limit of the norm occurs in 12% of patients, insulin – 40%, the HOMA index – the IR, exceeding the upper limit norm – at 92%. Excess was on average 69.9%.

In the second group of comparative analysis showed that the level of glucose in 20% of patients had higher physiological insulin – 44%, and insulin was detected in 92% of patients, with median HOMA-IR index by 56.5% higher than the upper threshold standards.

Thus, the studies confirm the fact that the normal value of blood glucose does not guarantee the absence of hyperinsulinemia and insulin resistance. Consequently, in the list of mandatory pre-operative examinations, especially in obese patients and/or metabolic syndrome is necessary to introduce the definition of the state of insulin resistance (HOMA-IR index).

After primary surgery in patients of the first group either glucose or insulin levels had no significant difference. insulin resistance index, as well as in the preoperative period, 1.7 times ($p < 0.001$) higher than the upper value of the norm, which confirmed the presence of insulin resistance. The number of patients with insulin resistance was 92%. That is, in general, patients glycemic condition remained the same as before the transaction.

In the second group, after omentektomy of simultaneous, the situation has changed. So the average glucose levels, as well as in the preoperative period did not go beyond the average physiological values. Mid postoperative insulin also is within the physiological range, as in the preoperative period. On the surface, this gives grounds to speak about the absence omentektomy influence. However, an individual pair analysis of the indices in pre- and postoperative period revealed that 44% of those patients preoperatively marked hyperinsulinemia, normal levels were recorded in the postoperative period. That is marked positive effect on glycemic omentektomy health. However, since normal levels of insulin and

glucose does not guarantee the absence of insulin resistance in all patients calculated index HOMA-IR.

It turned out that if the preoperative condition of insulin resistance was detected in 92% of patients after omentectomy of simultaneous already only 64%. In this condition the severity of insulin resistance have decreased by an average of 44.91%.

Thus, simultaneous debulking greater omentum has a positive impact on carbohydrate metabolism and insulin resistance although it is not completely eliminated, but the degree of its severity is reduced. In fact, simultaneous debulking visceral fat is palliative measure to normalize if not, then to reduce the degree of severity of pathological insulin resistance.

Of course, in each case the amount of the operation must be selected individually, taking into account comorbidities, the impact of a possible extension of the time of surgery, but the strive for the most complete removal of the fatty omentum tissue necessary because cytoreduction visceral fat is technically simple surgery, but the pathogenetic logical and clinically warranted.

Conclusions

1. Implembtation of greater omentum debulking as the main depot of visceral fat, obesity and metabolic syndrome should be a routine step in the surgical benefits, as it creates favorable conditions for the correction of carbohydrate metabolism by reducing the severity of hyperinsulinemia and insulin resistance.

2. Simultaneous omentectomy should be considered to be a palliative treatment that reduces the likelihood of diabetes and, if technically possible, give preference to bariatric treatments.

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