



Appendicitis as a complication after liposuction

Apendicite como complicação em pós-operatório de lipoaspiração

JOÃO MÁRCIO PRAZERES DOS
SANTOS^{1,2*}
NATÁLIA JÚLIA DA COSTA²

Institution: Clínica Dr. Evandro Ribeiro de
Oliveira, Juiz de Fora, MG, Brazil.

Article received: October 13, 2016.
Article accepted: February 21, 2017.

Conflicts of interest: none.

DOI: 10.5935/2177-1235.2017RBCP0049

■ ABSTRACT

Introduction: The demand for aesthetic plastic surgery has increased steadily mainly for the appearance of new surgical techniques and these procedures greater social acceptance. Most frequent procedures are: breast surgery (augmentation or reduction), liposuction, tummy tuck surgery and facial surgery. Acute appendicitis is the most common cause of acute abdomen. The appendectomy constitutes one of the most common surgery performed worldwide. Appendicitis has a high incidence among young white adult men. We report a case of acute appendicitis as a complication after liposuction, emphasizing such complication correlation with the surgical procedure. **Methods:** We searched scientific data from June to December 2015 indexed in Medline/PubMed database related to complications in liposuction, especially cases associated with appendicitis. **Conclusion:** Postoperative complications are distressing for both patient and physician. The number of plastic surgeries is still rising and procedures are becoming more frequent, therefore, procedure-related facts should be further study. The development of predictive score of complications in plastic surgery would help surgeons to define preventive measures, take best choices and perform better discussion related to risks of the patient already in the postoperative period.

Keywords: Lipectomy; Postoperative complications; Appendicitis; Appendectomy; Reconstructive surgical procedures.

¹ Sociedade Brasileira de Cirurgia Plástica, São Paulo, SP, Brazil.

² Faculdade de Medicina de Barbacena, Fundação José Bonifácio Lafayette de Andrada, Barbacena, MG, Brazil.

■ RESUMO

Introdução: A demanda por cirurgia plástica estética tem aumentado progressivamente, devido principalmente às novas técnicas cirúrgicas e maior aceitação social. Dentre os procedimentos mais frequentemente realizados estão: cirurgias de mamas (aumento ou redução), lipoaspiração, abdominoplastia e cirurgias faciais. A apendicite aguda é a causa mais comum de abdome agudo e a apendicectomia é uma das cirurgias mais realizadas em todo o mundo. Sua maior incidência ocorre em adultos jovens, no sexo masculino e em indivíduos da raça branca. O objetivo do presente estudo é relatar um caso de apendicite aguda como complicação em pós-operatório de lipoaspiração, ressaltando sua correlação com o procedimento cirúrgico.

Método: Foi realizada pesquisa na base de dados do Medline/PubMed, no período de junho a dezembro de 2015, avaliando todos os artigos publicados que referissem complicações em lipoaspiração, principalmente aqueles casos associados à apendicite. **Conclusões:** As complicações pós-cirúrgicas são aflitivas tanto para o paciente quanto para o médico e, devido ao crescimento contínuo do número de cirurgias plásticas, são cada vez mais frequentes, merecendo um estudo mais detalhado e de aplicação prática. A elaboração de um escore preditivo de complicações da cirurgia plástica auxiliaria o cirurgião a definir condutas preventivas, permitindo melhores escolhas e melhor discussão de riscos com o paciente já no pré-operatório.

Descritores: Lipectomia; Complicações pós-operatórias; Apendicite; Apendicectomia; Procedimentos cirúrgicos reconstrutivos.

INTRODUCTION

Aesthetic plastic surgery procedures are still rising steadily, mainly for appearance of new surgical techniques and these procedures greater social acceptance. The procedures most common performed are: breast surgery (augmentation or reduction), liposuction, abdominoplasty and facial liposuction surgeries¹. The liposuction is a cosmetic procedure for fat removal in healthy patients to reduce accumulation of localized fat, the so-called lipodystrophy leading to improvement in body contouring².

The first formal presentation of liposuction to Brazilian surgeons was in 1980 during the Congress of the Brazilian Society of Plastic Surgery (SBCP) in Fortaleza³. After that, this technique has improved, became less invasive and has focused on preservation of local circulation².

The help of media, television, advertisements and photos of actors and actresses with thin, toned and sculpted bodies, which are considered almost perfect by the society, lead those who are dissatisfied with their own bodies to seek plastic surgery clinics to achieve the miracle of rapid weight loss and youthful appearance.

Liposuction, as any other surgical procedure, might have local and systemic complications⁴. A survey

performed by the SBCP⁵ in 2014 that included 738 plastic surgeons who responded an online survey on interurrences during and after liposuction showed that 14.77% of the cases develop deep vein thrombosis, 5.42% die, 4.07% present fat embolism complications, 3.66% hemorrhagic shock, 2.98% unknown causes, 2.03% abdominal cavity perforation, 1.9% sympathetic nervous system disorders, 1,76% hypovolemic shock by large volume Liposuction, 0.95% drug-induced anaphylaxis, 0.81% hypothermia, and 0.54% chest cavity perforation.

A number of local complications can also appear such as skin disorders (visible and palpable), prolonged swelling, bruising, hyperpigmentation, changes in skin sensitivity, seroma, hematoma, insufficient correction of lipodystrophy, ulcers and skin necrosis, local infections, dermatitis, unaesthetic scars and persistent edema. In addition, systemic reactions can appear such as fever, systemic infection, cardiac arrhythmia, tachycardia, anemia or sepsis².

The acute appendicitis is the most common cause of abdominal pain⁶ and appendectomy one of the most common surgical procedures done in the world. This disease has a high incidence among young white adult men. Although controversial, the most accepted theory for the etiology is that acute obstruction of the appendiceal lumen due to lymphatic hyperplasia, or

fecaloma or foreign body⁷. No related cases were found in the literature on acute appendicitis as a complication after liposuction.

CASE REPORT

A.L.R.N.B, 21-year-old, previously healthy, after perform clinical and laboratorial exams to confirm clinical conditions to proceed with procedures, underwent in July 9 2015 a nasal cosmetic surgery and liposuction in the back, flank and abdomen, and fat injection in the gluteal region. The wet liposuction technique was used, and approximately 2.5 liters of fat was removed and about 1 liter was reinjected, after washing with saline solution, in the gluteal region. In July 20 2015, the patient had no complaints. At this date, surgical follow-up was done, sutures removal, and the patient was referred to lymphatic drainage. The did not present ecchymosis or any other change in physical examination.

In the morning of July 21 2015, the patient reported high intense epigastric pain. The pain sensation was like burning. The patient had reported similar episodes before, but an endoscopy performed 1 year before did not show changes. Patient underwent treatment at private health hospital. The laboratorial exams showed white blood cell count of 13,000/mm³ without deviation, normal urinalysis. The abdominal CT scan without contrast did not show changes. The patient was discharged, and analgesics were prescribed. The patient was advised to return if any symptoms appear.

The patient returned to the hospital for the next day complaining of worsening pain and migration to the right iliac fossa, loss of appetite and vomiting. Exams showed white blood cells of 23,000/mm³ with left deviation. The patient was examined by a urologist and no urinary tract changes were found. The patient was referred in the same day to other public health hospital with diagnosis of acute appendicitis.

Laboratory review showed: hemoglobin 13.5 g/dl, hematocrit 40.8%, leukocytes of 23,900/mm³, rods of 2%, neutrophils of 79%, eosinophils of 1%, lymphocytes of 12%, monocytes of 6%, 161 mg/L c-reactive protein (reference value: <10 mg/L), unchanged urinalysis. A new CT scan without contrast was performed and no changes were found.

Appendectomy performed on 23 July 2015 using infraumbilical midline incision, and surgical report of stage IV appendicitis. The patient was discharged on 25 July 2015, asymptomatic, and with significant improvement of laboratory tests: hemoglobin 11.4 g/dl, LG 9,000/mm³, rods of 2% and neutrophils of 80%. PCR was still high, more than 90 mg/L.

DISCUSSION

The SBCP, which is of the largest plastic surgery association in the world, reports along with the research institute Datafolha that 629,000 plastic surgeries are carried out yearly in Brazil, 73% of them are aesthetic and 27% reconstructive surgeries. Liposuctions represents 20% of all cosmetic procedures, behind only to augmentation mammoplasty².

As has been shown in the literature, the growth of plastic surgery procedures increases frequency of complications. Patient safety is undoubtedly the most discussed topic in medical events and scientific publications; this topic discussion is particularly high in plastic surgery¹.

The plastic surgeon should evaluate the patient considering the same rigorous standards adopted in other types of surgery, including detailed preoperative evaluation, physical examination and laboratory tests, as well as monitoring in surgery and immediate after surgery to ensure safety and quality of the operation. It is important to collect data on drug use or abuse, consumption of alcoholic beverages and smoking, as well as guidance before the procedure.

Preoperative evaluation is key for a safe surgical procedure, and it includes detailed anatomical and physiological knowledge, as well as decision on the most appropriate technique for the patient¹. Aesthetic plastic surgery undergone in certified surgical sites presents low incidence of complications, even when they are not done in hospitals¹.

However, the physiological stress associated with surgical procedure is a safety factor that must be considered when choosing the most appropriate place to the surgery. Among the main factors that can lead to physiological wear, those caused by blood loss during surgery can be cited, such as hypothermia, liposuction combined with other procedures, procedure duration and risk of thrombosis or pulmonary embolism¹.

One of the most critical attributes to be analyzed in relation to patient safety is the time, including surgery time and average length of stay in the post-anesthetic care unit. Most plastic surgery procedures last for over an hour. In addition, when more than one procedure are done simultaneously the duration of the surgery increases. In our case the surgery duration was 3 hours including anesthesia.

A study in the 70s already reported that surgeries lasting more than six hours dramatically present an increase in the incidence of cardiac, renal and pulmonary complications after the surgery¹. In liposuction a major risk factor for the development of complications is the excessive fat removal.

In Brazil, the Federal Council of Medicine resolution no. 117, Article 9, 2003 describes the safe limits for suction. The resolution states not exceed 5-7% of patient's body weight and respect 40% limit of the body surface. These both recommendations were followed in our case.

Bacterial infection has as main risk factors the poor hygiene, early discharge, and patients unsuitable for surgery. Possible predictors of surgical complications are: a) malnourished patients; b) associated procedures; and c) duration of the surgery¹.

Currently, adipocytes are known to be the main storage triglycerides and also linked to maintenance of systemic inflammatory condition because of their lipid metabolism, and action of a variety of mediators. However, no evidence exist on relationship between this inflammatory process and acute appendicitis, particularly because studies have shown that liposuction may increase or decrease inflammatory mediators with interleukin-6, interleukin-10, tumor necrosis factor alpha⁸.

Acute appendicitis pictures are usually diagnosed by clinical history and physical examination⁹. However, typical signs such as migratory pain to the right iliac fossa may be absent in one-third of cases, therefore, attesting the important of complementary exams.

In the literature, the ultrasonography shows 75 to 93% sensitivity and 91 to 100%⁶ specificity compared with CT it has lower cost. Ultrasonography has limitations such as patient's obesity, equipment availability and experienced examiner⁶.

Our patient underwent abdominal CT scan without contrast and no signs were seen for positive diagnosis of appendix equal to or greater than 6 mm, periappendiceal enlargement or appendiceal inflammatory changes.

COLLABORATIONS

JMPS Analysis and/or interpretation of data; final approval of the manuscript; completion of surgeries and/or experiments; writing the manuscript or critical review of its contents.

NJC Analysis and/or interpretation of data; writing the manuscript or critical review of its contents.

REFERENCES

1. Saldanha OR, Salles AG, Laverias F, Saldanha Filho OR, Saldanha CB. Fatores preditivos de complicações em procedimentos da cirurgia plástica - sugestão de escore de segurança. *Rev Bras Cir Plást.* 2014;29(1):105-13.
2. Franco FF, Basso RCF, Tincani AJ, Kharmandayan P. Complicações em lipoaspiração clássica para fins estéticos. *Rev Bras Cir Plást.* 2012;27(1):135-40. DOI: <http://dx.doi.org/10.1590/S1983-51752012000100023>
3. D'Assumpção EA, Pimentel L, Gemperli R, Baroudi R. Debate sobre Complicações em Lipoaspiração. *Rev Bras Cir Plást.* 2005;20(2):127-9.
4. Avelar LET, Lapertosa L, Versiani MT. Óbitos pós-lipoaspiração. *Rev Bras Cir Plást.* 2010;25(Supl):1-102.
5. Cupello AMB, Dornelas M, Aboudib Junior JH, Castro CC, Ribeiro LC, Serra F. Intercorrências e óbitos em lipoaspiração: pesquisa realizada pela comissão de lipoaspiração da SBCP. *Rev Bras Cir Plást.* 2015;30(1):58-63.
6. Freire Filho EO, Jesus PEM, D'Ippolito G, Szejnfeld J. Tomografia computadorizada sem contraste intravenoso no abdome agudo: quando e por que usar. *Radiol Bras.* 2006;39(1):51-62. DOI: <http://dx.doi.org/10.1590/S0100-39842006000100011>
7. Fischer CA, Pinho MSL, Ferreira S, Milani CAC, van Santen CR, Marquardt RA. Apendicite aguda: existe relação entre o grau evolutivo, idade e o tempo de internação? *Rev Col Bras Cir.* 2005;32(3):136-8.
8. Pintarelli G, Gomes RS, Rocha JD. Lipoaspiração: atualização dos fatores de riscos metabólicos e sua importância clínico-cirúrgica. *Rev Bras Cir Plást.* 2014;29(3):457-67.
9. Peixoto RO, Nunes TA, Gomes CA; TCBC-MG. Índices diagnósticos da ultrassonografia abdominal na apendicite aguda. Influência do gênero e constituição física, tempo evolutivo da doença e experiência do radiologista. *Rev Col Bras Cir.* 2011;38(2):105-11.

*Corresponding author:

João Márcio Prazeres dos Santos

Av. Presidente Itamar Franco, 2100/302 - São Mateus - Juiz de Fora, MG, Brazil

Zip Code 36025-290

E-mail: jmprazsantos@hotmail.com