



RESEARCH WORK

doi: 10.35366/110921



Medical tourism in plastic surgery, is it possible to keep up this practice? Experience and report of complications in patients operated at beach destinations

Turismo médico en cirugía plástica, ¿es posible mantener esta práctica? Experiencia y reporte de complicaciones en pacientes operados en destino de playa

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Keywords:
medical tourism,
plastic surgery,
complications.

Palabras clave:
turismo médico,
cirugía plástica,
complicaciones.

ABSTRACT

Every year, a significant number of patients travel all over the world to get medical treatment. This was a retrospective study on patients who traveled by plane from other countries to beach destination in Mexico to undergo plastic surgery procedures from 2015 to March 2020 prior to the pandemic. We defined a major complication as one that required reoperation within the first 28 days after surgery or admission to hospital. We divided the operations into three types: face, breast, and body. Face surgeries were not combined with breast or body procedures. A total of 360 patients, who were operated on, were included. Three of the patients had major complications (0.83%): one patient had implant infection that required hospital admission and the removal of one of the prostheses; one suffered a heat stroke, and one formed a hematoma after facial surgery that required exploration in the operating room. No patient developed thrombosis, pulmonary thromboembolism, or micro or macroscopic fat embolisms. We suggest a three-week stay with no more than three procedures lasting less than five hours per event and a waiting time between the arrival of an international flight and the surgery of 48 to 72 hours to help maintain patients' safety.

RESUMEN

Cada año, un número significativo de pacientes viaja por todo el mundo para recibir tratamiento médico. Éste es un estudio retrospectivo en pacientes que viajaron en avión desde otro país a un destino de playa en México con el objetivo de someterse a procedimientos de cirugía plástica en el periodo de 2015 a marzo de 2020, antes de la pandemia. Definimos como complicación mayor; aquella que requiere reintervención en los primeros 28 días tras la cirugía o ingreso hospitalario. Dividimos los procedimientos en tres tipos: facial, mamario y corporal; los faciales no se combinaron con mamaros o corporales. Se incluyeron 360 pacientes, tres de ellos presentaron complicaciones mayores (0.83%): uno tuvo infección de implante que requirió ingreso hospitalario y retiro de una de las prótesis; uno sufrió un golpe de calor y uno formó un hematoma posterior a cirugía facial que requirió exploración en el quirófano. Ningún paciente desarrolló trombosis, tromboembolismo pulmonar, embolismo graso micro o macroscópico. Sugerimos una estadía de tres semanas, realizando no más de tres procedimientos con duración de menos de 5 horas por evento y un tiempo de espera de 48 a 72 horas entre la llegada de un vuelo internacional y la cirugía para mantener la seguridad de los pacientes.

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Received: February 21, 2023

Accepted: March 06, 2023

How to cite: Ramos-Gallardo G, Cárdenas-Camarena L, Cuenca-Pardo J, Estrada-Martín E, Sánchez-Rodríguez A, Martínez-García HL. Medical tourism in plastic surgery, is it possible to keep up this practice? Experience and report of complications in patients operated at beach destinations. *Cir Plast.* 2023; 33 (1): 28-35. <https://dx.doi.org/10.35366/110921>

INTRODUCTION

Every year, a significant number of patients travel all over the world to obtain medical treatment. In the case of plastic surgery, the treatments can be outpatient, short-stay, or more complex procedures with longer follow-up and recovery.¹

When we look for medical evidence about this activity, most of the reports are about complications, many of which are caused by non-specialists who seek financial benefits without having the necessary training and accreditation. Tijuana or the Dominican Republic are examples of places where plastic surgeries were performed by non-specialists with catastrophic results that required attention in their countries of origin with the corresponding notices not to travel to undergo any type of surgery.^{2,3}

For this reason, we decided to report the major complications that required admission or reoperation within a five-year period and the ways in which they were solved in patients who underwent a procedure in the specialty of plastic surgery, with the hope that the information will help more colleagues to promote safe procedures performed by specialists with the training and accreditation in our case endorsed by the Mexican Council of Medical Specialties (CONACEM).

MATERIAL AND METHODS

This is a retrospective study on patients who came to Puerto Vallarta, Mexico with the objective of obtaining plastic surgery procedures. The trips were made by plane from other countries to Mexico.

Patients who had a complete record, had signed over their consent authorizing the use of their photographs for educational and research purposes, and had undergone surgery within the period from 2015 to 2020 before the pandemic were included (March 2020).

Previous contact with the patients was by email, videoconference or by previous vacation to Mexico. During the first interview, the plastic surgery procedures, handling in relation to travel and surgery, and subsequent follow-up were explained. Printed information

was provided as well as the corresponding link to the Mexican Association of Plastic, Aesthetic and Reconstructive Surgery and the Mexican Council of Plastic, Aesthetic and Reconstructive Surgery. Using this information, the patients could verify whether the procedure request would be performed by the appropriate specialist.

Management before, during and after plastic surgery was explained. The main purpose was to prevent complications. Thrombotic events such as micro- or macroscopic fat embolism during body contouring surgery (liposuction) can be a catastrophic and devastating problem for patients who travel for plastic surgery.

Patients who traveled by plane (international flight) to undergo plastic surgery were included. The minimum waiting time for surgery upon arrival was 48 to 72 hours, with a minimum stay of three weeks.

Upon arrival in Mexico, complete blood work was performed, including complete blood cell count, PT, PTT, INR, serum electrolytes, blood chemistry, liver function tests and general urine examination. There was an assessment by internal medicine or cardiologist prior to the medical history by the treating physician. In the case of breast surgery, an ultrasound or mammogram was performed before the surgery.

The surgeries were performed in hospitals with full-service X-rays, laboratories, hemodynamics, intensive therapy and emergency service 24 hours a day.

The procedures were divided into three groups: face, breast and body. The body procedures included abdominoplasty and liposuction with or without fat grafts to the buttocks. The breast procedures included breast plastic surgery, namely mammoplasty with implants, breast reductions or lifts. The face procedures included blepharoplasty and facial rejuvenation or face lift.

Patients who had experienced massive weight loss, patients with previous pathology related to breast implants such as capsular contracture or chronic seroma, and patients with breast reconstruction or feminization or gender change procedures were not included.

When more than one procedure was performed during the same surgery, body

contouring procedures (liposuction with or without fat graft, tummy tuck) were combined with breast plastic surgery (mammoplasty with implants, breast lift or breast reduction). Face procedures (blepharoplasty or rhinoplasty) were not combined with body or breast surgery.

No surgical time lasted for more than 5 hours, and the combination of procedures within the same surgery was not more than three.

Surgical and anesthetic management included three types of procedures: body, breast and face.

For body contouring, the surgeries were performed with regional anesthesia and sedation, the use of intermittent pneumatic compression stockings, hydration, close monitoring of diuresis, and chemoprophylaxis that began the next day for four days. Analgesia with non-steroidal anti-inflammatory drugs such as ketorolac in addition to paracetamol and tramadol were continued for five days later, and only paracetamol is recommended to treat pain as long as it is needed. Discharge from the hospital occurs one day after surgery. Antibiotic prophylaxis (cephalosporins) continues for one week.

When only breast plastic surgery was performed, the surgery was performed under regional anesthesia and sedation with the use of intermittent pneumatic compression stockings. After surgery, early ambulation is encouraged. Analgesia with non-steroidal anti-inflammatory drugs such as ketorolac in addition to paracetamol and tramadol are continued for five days, with paracetamol only for as long as it is needed. When breast plastic surgery only was performed, the patients were discharged the same day as the surgery. They were then observed the next day. Antibiotic prophylaxis (cephalosporins) continued for a week.

Facial plastic surgery was not combined with other procedure types, unlike body contouring or breast surgery during the same trip. The type of anesthesia was local with non-dissociative sedation. We used lidocaine with epinephrine by diluting a 50 cc bottle at 0.2% in 100 cc saline solution and a 10-cc vial of bicarbonate. The aim was to maintain muscle tone to allow movement in the legs. Analgesia is indicated in the same way. Assisted ambulation is allowed from the early postoperative period. The head is kept elevated with the use of frozen gel or

ice for the first 24 hours. Discharge occurs the day after surgery. Antibiotic prophylaxis (cephalosporins) continues for a week.

The first three days of nursing visits are performed in the place where they are staying. Patient follow-up was completed during their stay with one or two visits per week while they were in Mexico. This care consists of hydration, continuous walking during the day and the use of compression garments for two weeks following body contouring and breast surgery or five days for facial surgery (facelift).

Major complications were defined as those that required hospitalization or reoperation during the same stay in Mexico. Antibiotic prophylaxis is given for a week according to common standards in surveys performed by the Mexican Society of Plastic Surgery.⁴

Ethical aspects. This was a retrospective clinical study based on a review of clinical files without the direct participation of the patients. Therefore, there was no risk to any patient, and the confidentiality of patients and surgeons was maintained. We declare that there are no conflicts of interest that may have influenced the results.

RESULTS

In total, 360 patients were included over six years from 2015 to 2020 (prior to the pandemic). Of these, 322 were women and 38 were men. The average age was 45 years old (ranging from 21 to 85 years old). Regarding the point of origin, 355 patients came from North America (USA or Canada), two from Russia, one from South Africa, one from England and one from New Zealand.

It is worth mentioning that in this report, when evaluated by a cardiologist, five patients could not receive treatment because they had 2 with poorly controlled blood pressure, 2 with heart failure and 1 with undiagnosed arrhythmia. According to the exclusion criteria, the following patients were excluded: 54 patients with massive weight loss who came in for abdominoplasty and 16 for brachioplasty, 52 patients with previous pathology related to breast implants such as capsular contracture who came for removals of breast implants and/or replacement with capsulectomy and 17 gender change procedures.

The average time between the first contact and surgery was 44 days (7 to 297 days). The average length of stay in Mexico was 35 days (21 to 67 days). Fifty-three patients (14.7%) visited the destination before their surgeries. A total of 349 (96.9%) patients had detailed videoconferences before their surgeries. A detailed in-person consultation was performed with 100% of the patients. An average of 6.2 emails (4 to 15 emails) were exchanged between the first contact and surgery. An average of 8.2 emails (4 to 18 emails) were exchanged between the last in-person consultation and the last videoconference. Satisfaction after surgical procedure was rated on a 4.8 to 5 scale (4.5 to 5) before patients arrived in Mexico for the last in-person consultation. One surgical team performed the surgical procedures.

Of these patients, 92 had two or three procedures performed during the same surgery.

A total of 464 procedures were performed, including the following:

- **Body contouring:** liposuction with or without fat graft, 72, and abdominoplasty, 65.
- **Breast plastic surgery:** mammoplasty (implants), 222, lift or reduction, 28.
- **Facial plastic surgery:** face lift, 43, and blepharoplasty, 34.

Three patients presented major complications (0.83%): an implant infection that required hospital admission and removal of one of the prostheses, one patient presented with heat stroke and one had a hematoma during facial surgery that required exploration in the operating room. No patient presented thrombosis, pulmonary thromboembolism, or micro- or macroscopic fat embolism. Minor complications were reported as minor dehiscence of the surgical incision in 23 patients (6.3%) and seroma in 27 patients (7.5%).

The following is a description of the three cases with major complications:

- **Case 1.** A 50-year-old female patient from Vancouver, Canada, underwent abdominal contour surgery (abdominoplasty) and

breast augmentation mammoplasty. The week after surgery began with an increase in temperature in the right breast and discharge of purulent material. In culture, *Pseudomonas aeruginosa* was isolated. The patient presented fever and malaise, which is why she was admitted for treatment with intravenous antibiotics. The patient was taken to the operating room where the prosthesis was removed and the pocket was washed. She was discharged with continuing treatment using oral antibiotics. The patient returned to her country of origin. Six months later, the implant was relocated without presenting complications (*Figure 1*).

- **Case 2.** An 81-year-old male patient from Quebec, Canada, suffered from high blood pressure with good control and underwent blepharoplasty, which was performed without complications. Three days later, the patient went to the emergency room for heat stroke. He received intravenous hydration. The patient did not speak English or Spanish. The indications were not clear, and he understood that he should not bathe and should not stay in places with air conditioning. At the time of discharge from the emergency room, the information was explained with the help of a translator. The evolution of the patient's conditions was followed without any complications (*Figure 2*).
- **Case 3.** A 65-year-old female patient from Denver, USA, was previously healthy. She came for a facelift. During the early postoperative period, she presented an increase in volume on the right side of the face with greater pain on that side. Drainage was performed while she was in bed. Later, she returned to the operating room without finding active bleeding. Drainage is left, which was removed after two days. The patient completed her stay in Mexico without other complications.

DISCUSSION

The use of the internet as well as the impact of social media have given patients greater access to information. Therefore, the world is more

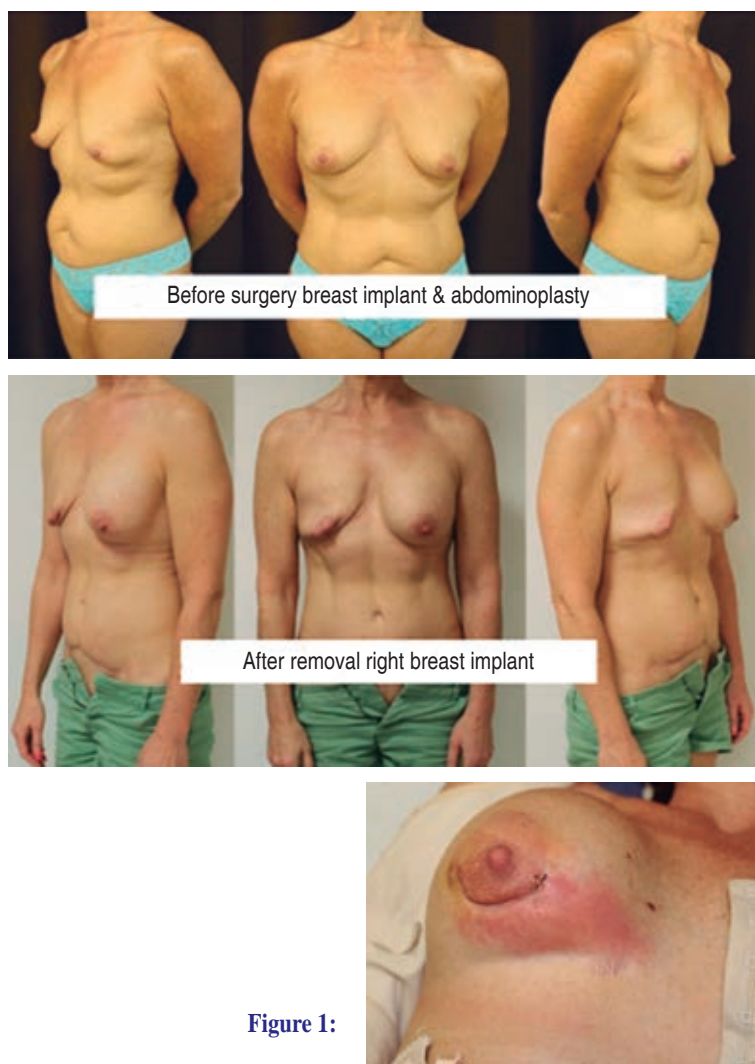


Figure 1:
Case of surgical
breast infection.

Inflammation on right breast
due implant infection

connected. In some circumstances, this media makes it more attractive to patients to travel and enjoy tourist destinations while seeking health services.^{5,6}

It is very important to be able to communicate the recommendations for each specialty to offer a health service leading to the fewest possible complications and makes the stay safe in all respects. Our specialty is to address problems related to other specialties and non-specialists who perform plastic surgery procedures. Many complications from medical tourism in aesthetic surgery are caused by non-plastic surgeons. For this reason, we consider it important to report

our experience and better practices. *Table 1* is a summary of points to consider during medical tourism in plastic surgery.

The first case we observed was a complication from infection. It is worth mentioning that this information is not part of the report, but the hospital unit where the procedure was performed was undergoing remodeling through a process lacking the relevant regulations for that purpose by the health authority. On that day, two more patients received operations, the same microorganism was isolated, and the infection management was the same. Within the same week, there was wound dehiscence and minor infections that did not require the removal of the prosthesis. As a result of these events, it was decided to change the hospital.

The specialist doctor involved in medical tourism must monitor and above all verify that the sterilization processes, care of equipment and cultures are in order in the unit where they perform their procedures. We currently work in hospitals that follow recommendations by epidemiologists who evaluate complicated cases monthly, with open discussions in a committee. Fortunately, since then, the complications in terms of infections have been minimal.

We did not want to mention the impact of the pandemic on medical tourism. Like many areas of the country, we faced the closure of activities with a lack of information from authorities on how to work and how to act on health issues other than respiratory disease. We actively participated in creating recommendations to reactivate private health activity, especially to avoid the collapse of the clinics and the economic repercussions on many collaborators.⁷ It is worth mentioning that access to COVID tests was initially null, so we started by taking CT scans prior to surgeries. Currently, we already have well-established protocols, and test access is different.

A high percentage of plastic surgeons closed their offices. We have knowledge of the Mexican Association of Plastic, Aesthetic and Reconstructive Surgery, and fourteen members required invasive mechanical ventilation. Only two could be de-ventilated. One of them continues to work.

It is important to mention that we have not observed thrombotic events. Pulmonary

embolism is a catastrophic event. We have made a great effort to create strong recommendations for avoiding these types of complications.⁸

Microscopic or macroscopic fat embolism (MIFE [micro fat embolism], MAFE [macro fat embolism]) are associated with body contouring surgery in our specialty.⁹

As we have described, fat macroembolism can be prevented by avoiding infiltration into the deep planes of the gluteus muscle where the vessels are located. It is important to avoid the use of the lower quadrants of the gluteus, especially the lower lateral quadrant. As we probed in the anatomic model, we were more likely to infiltrate the gluteal vein and cause pulmonary embolism. Infiltration must be performed through the upper quadrants for safer procedures.¹⁰

The use of intermittent pneumatic compression stockings, early assisted ambulation, adequate hydration with diuresis monitoring, chemoprophylaxis, and the appropriate selection of patients and procedures reduce the risk of complications related to our specialty.^{11,12}



Figure 2: Case of dehydration.

Table 1: Important points to consider for plastic surgery medical tourism.

1. Verify that the specialist is board-certified in plastic surgery. In Mexico, this confirmation can be performed online using the following link: <https://cmcper.org.mx/directorio/>
2. Previous contact with the patient by videoconference and/or visit to the destination before surgery
3. Wait 48 to 72 hours to perform any surgery after the patient arrives. This period of time can be used to perform a blood test, x ray, EKG and evaluation by internal medicine doctor or cardiologist
4. Make a plan. In our case, we do not combine facial procedures with those of other parts of the body. Breast or body procedures can be combined. No more than 5 hours should be spent in the OR, with no more than three procedures per trip
5. Assess risk and prevent complications. Keep patient well hydrated during surgery, use intermittent pneumatic compression stockings, employ a well-trained team, and use complete and prepared facilities. Discuss the benefits and risks of chemoprophylaxis
6. Choose the type of anesthesia with which you feel comfortable. In our case, we favor regional or local anesthesia with IV sedation
7. Provide regular visits by nurses after the surgery at the place where the patient is staying. They should have regular visits in the office. After their departure, keep contact through videoconference
8. It is preferable to keep the patient in the area for at least three weeks. The patient can recover from the procedure and enjoy the destination during their last visiting days
9. Explain follow up, possible risks and complications. Also clarify that if complications occur, how they can be solved. An educated patient is always better

The selection of the patient and the procedures that can be performed during the same surgery is very important. We have worked on reports of complicated cases, both in medical legal matters and autopsies

in Mexico and abroad. In this way, we have applied the Caprini scale using information on confirmed cases of thrombosis.¹³ Although this scale is not the only one, it is the one with the most references in our specialty. Plastic surgery, like many other specialties, differs in its procedures and types of patients. Therefore, we consider that in body contouring surgery, abdominoplasty should be considered carefully when combined with other procedures. It is not wise to combine this procedure with other surgeries outside the specialty, especially with obstetric care.¹⁴ It is important to note that patients who have traveled by plane prior to surgery are included. Patients already living in Mexico who are foreigners are not being considered. We are developing a protocol in which inflammation markers such as interleukin 6 will be measured as well as ultrasound of the lower extremities before surgery to assess the formation of thrombi that could be asymptomatic. No patient underwent surgery the day after their arrival in Mexico. Therefore, it is advisable to wait at least 48 to 72 hours. The fact that patients can stay for three weeks has clarified doubts regarding their subsequent follow-up. Surgery can cause changes in the skin, such as bruising or inflammation, which may be more evident in the second week following the procedure. For this reason, we do not recommend staying for as short a period of time as a week. We encourage our patients to stay for three weeks. Most of them accept this advice and stay longer. During the last part of the trip, they can enjoy the destination.

We are working on a satisfaction questionnaire. Few medical tourism reports do not mention complications. Therefore, we urge those who perform this type of activity to report their experience to create more publications that can help to make better guidelines for this activity.¹⁵⁻¹⁷

CONCLUSIONS

Medical tourism is an activity that will continue to occur for many specialties. In the case of plastic surgery, it is possible to reduce complications by following a process that can be evaluated often. Although there are cases of complications, attention must be paid by the

health authority to monitor compliance with the regulations both in that the health professional is duly trained to perform the requested procedure and that the health institution has everything necessary to perform medical and surgical practice. Regarding plastic surgery, we can make the following recommendations:

1. Do not perform a major surgical procedure immediately upon patient arrival; in the case of an international flight, it is recommended to wait 48 to 72 hours. This time will be useful for assessing the patient's condition upon arrival.
2. If there is any doubt that the patient is not in adequate condition for surgery, do not perform the procedure.
3. It is desirable to have prior communication with the patient, with videoconference being a way to be able to talk about the procedure and give information about the protocol in question.
4. Emphasize the importance of the patient staying in the country where the surgery is performed for at three weeks. Once they return to their destination, it will be difficult to have the support of a specialist to make a face-to-face consultation in case of any doubts during the immediate postoperative period.
5. There should be a previous evaluation by a cardiologist as well as updated blood tests and image study in the country where the procedure will be performed. Every patient must be medically known by the treating surgeon.
6. The procedure should not exceed five hours in the operating room. A surgical plan should be performed according to the current state of the patient. In plastic surgery, we do not recommend mixing facial plastic surgery with breast or body contouring procedures.
7. Body contouring surgery follow-up care, especially in the case of abdominoplasty, should emphasize early ambulation, adequate hydration, monitoring diuresis, the use of intermittent pneumatic compression stockings, and chemoprophylaxis when indicated. The measures already known in liposuction and gluteal fat grafting must

be followed to prevent fat embolism, especially macroembolism (MAFE for its acronym in English).

Complications are expected and are related to our practice. Medical tourism is not exempt. They cannot be completely avoided; however, we believe that informing the patient of how we can prevent them and how they will be managed can help maintain the doctor-patient relationship and continue to provide safety in our practice.

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Conflict of interest: the authors declare no conflict of interest.

Statement of human participation or ethical approval: this was a retrospective clinical study based on a review of clinical files without the direct participation of the patients. Therefore, there was no risk to any patient, and the confidentiality of the patients and surgeons was maintained. The approval number was provided by the bioethics committee at the Centro Universitario de la Costa, Universidad de Guadalajara 202205.

Informed consent: the patients signed a consent agreement to share pictures for educational and scientific purposes.

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