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Aesthetic surgery of the lower limbs in current orthopedic practice

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Introduction Correction of the shape of the lower extremities for aesthetic puposes has specific features that are associated with the role of the patient in the treatment process and assessment of results. An important element is the relationship between the appearance of the limb and changes in the axes of the skeleton. **Aim of study** Assessment of many-years of experience in orthopedic correction of the shape of the lower extremities for aesthetic purposes, discussion of possibilities, analysis of problems and search for possible ways to prevent them. **Methods** The material of the study was 123 patients who underwent aesthetic surgical correction in the period from 2005 to 2020. Their long-term results were followed in the period from 6 months to 11 years. In all cases, operations were performed simultaneously on both limbs. The total number of operations, thus, amounted to 246. The main indication for surgery was the so-called true O-shaped curvature (varus deformity) of the lower extremities. In all cases, the main elements of the operation were osteosynthesis with the Ilizarov apparatus and osteotomy of the tibia. Wires and half-pins were used as transosseous elements. To assess the main reference lines and angles (RLA), X-ray examination of the lower extremities was performed with the capture of the hip and ankle joints. **Results and discussion** Corrective manipulations in the group of patients led to a change in the position of the main RLA. Before treatment, MAD value was 15 ± 7 mm, after correction MAD = -2 ± 4 mm, before surgery MPTA = 85 ± 4º, after correction MPTA = 91 ± 2º. Subjective satisfaction was reported in 114 (92.7 %) cases. Subjectively unsatisfactory results were recorded in 4 (3.3 %) cases; objectively unsatisfactory results were detected in 5 (4.1 %) cases. **Conclusions** Aesthetic surgery of the lower extremities is a part of orthopedic practice and has its specific features due to the goal of realizing the patient's wishes about changing the appearance of the lower extremities indirectly by performing operations on the skeleton. Corrective surgery should be considered as a preventive intervention aimed at preventing the development of gonarthrosis in old age. The key to a good result is a careful selection of candidates for surgery and their compliance, along with a thorough explanation of the principles and features of correction.

Keywords: lower limb, aesthetic surgery, Ilizarov apparatus, corrective osteotomy

INTRODUCTION

Despite its almost half-century history, aesthetic surgery of the lower extremities, having occupied a certain niche at the junction of orthopedics and plastic surgery, has not established itself as an independent direction in any of these specialties.

It might be due to a certain conservatism of orthopedic surgery that historically has been treating severe skeletal pathology and rejecting the free spirit of plastic surgery. Until now, aesthetic interventions have been associated in the minds of ordinary people with glamor and excess, and among narrow professionals they seem frivolous and unnecessary. However, it is worth turning to history and recall that both plastic surgery and orthopedics have the same roots. The famous book by Nicolas Andry, published in 1741, was called the *Orthopaedia, or The Art of Correcting and Preventing Deformities in Children*. It was devoted not to orthopedics in the contemporary meaning of the word but to plastic surgery (cited from A. Shanz) [1]. Later, many well-known orthopedists tried to define the essence of the specialty. The most successful is the definition given by A. Shantz: "Orthopedics is a branch of medical science and art that deals with the study, prevention and treatment of skeletal deformities and related functional disorders" [1]. This definition could be a motto of this article since it best reflects the meaning and content of correction of lower limbs shape for aesthetic indications in the part related to the study and prevention of deformities.

Correction of lower limb shape for aesthetic indications includes several components, such as defining the indications for the operation itself and the magnitude of correction, a proper "orthopedic" component (operation and correction in the postoperative period), and evaluation of treatment results. To put it directly, we will discuss its surgical treatment based on the Ilizarov principles using a circular closed external fixator. We list a number of works in which other devices have been applied for this purpose such as extramedullary plates, intramedullary nails, monolateral apparatuses [2–4]. But it is the Ilizarov method that has been widely used

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in clinical practice due to its functional capabilities and a small number of serious complications [5–8]. Plastic surgery aimed at changing the volume and contour of the lower extremities should be mentioned separately. There are methods for reducing the volume of soft tissues, liposuction. It is especially important to remove excessive soft tissues that overhang in the area of the medial surfaces of the knee joints and on the lateral surface of the lower leg [9]. Plastic augmentation of the contours has been also chosen frequently. If large volume is required, then silicone gel implants are inserted along the medial surface of the shin [10]. To correct the contour of small defects, lipofilling has been used, or the introduction of adipose tissue taken from other body areas [9]. These operations are also aesthetic, but not related to orthopedics.

The indications for performing an intervention on the skeleton or soft tissues should be determined not by the preferences of the surgeon or the wishes of the patient, but by the shape of the legs. The classification proposed by us can be recommended for choosing a correction method [8]. Its main merit is that it is understandable to both doctors and patients. The so-called true curvature is associated with bone deformity, which is varus deformity, and a corrective osteotomy is indicated in such cases (Fig. 1). Bone deformity is absent in false curvature which is associated with the distribution of soft tissues. In such cases, plasty to correct contours should be indicated (Fig. 2).

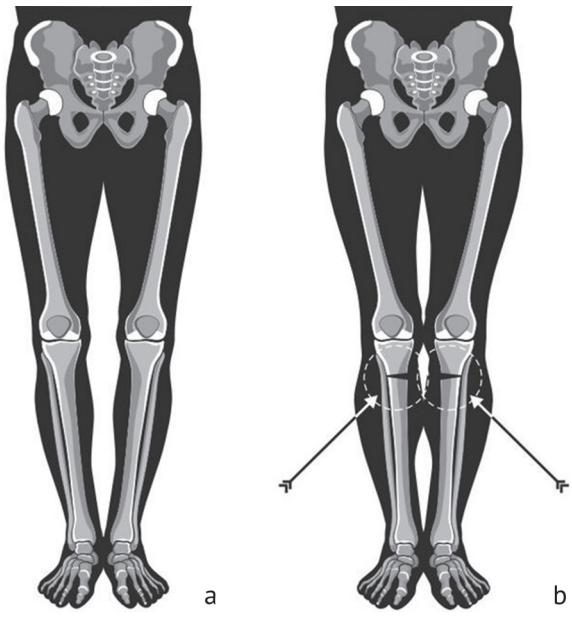

Fig. 1 Changing the shape of the legs by subcondylar osteotomy of the tibia is the most common method for correcting the true O-shaped curvature: ***a*** original appearance of the limbs, true O-shaped curvature; ***b*** subcondylar osteotomy of the tibia with angular displacement (peripheral fragments of the tibia are separated, forming an angle in the interfragmental space, open medially to ensure approximation of the knee joints with closed feet) [8]

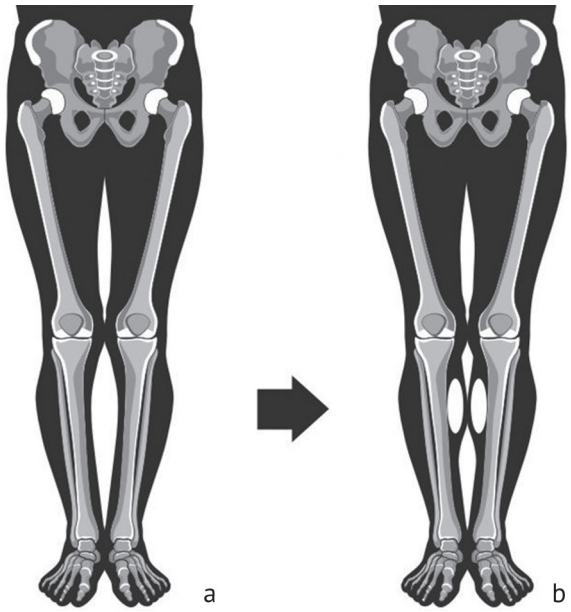

Fig. 2 Increase in the volume of the legs and correction of the false O-shaped curvature by the method of contour plasty with silicone implants: ***a*** original appearance of the limbs, false O-shaped curvature; ***b*** silicone gel implants increase the volume and provide closure in the upper third of the shin [8]

Orthopedic surgeons dealing with this problem need to have an understanding of all the methods to determine proper indications in order to avoid unnecessary operations that at best case scenario can lead to patient's dissatisfaction and to complications in the worst case.

Unlike other areas of the human body, the lower limbs have specific features that must be taken into account in any reconstructive intervention:

1) appearance of the limb depends on the shape of its skeleton. Therefore, any intervention on its bones has an impact on the limb shape (appearance);

2) change in the shape of the lower limb skeleton inevitably results in its function. Therefore, it is necessary to take into account the impact of the intervention to change the appearance, which can be either positive or negative;

3) lower extremities should be considered as "a single functional system" [1]. This is not a "paired" body organ in the usual sense, when the absence of the other "paired half" or its significant damage would preserve the work of the entire system. The defect of one limb inevitably affects the functioning of the lower limbs as a whole system. The ability of walking is lost if one leg is absent. All this imposes special requirements to the "equality" of both legs.

The aim of the study was to assess our long-term experience of orthopedic correction of lower limb shape for aesthetic purposes, discuss the possibilities, analyze problems and search for possible ways to prevent them.

MATERIAL AND METHODS

The object of the study was 123 patients who were treated surgically in the period from 2005 to 2020. Their results were followed from six months to 11 years. Surgical interventions were performed simultaneously on both limbs. Thus, the total number of operations was 246. The age of the patients was from 18 to 50 years (mean age, 28.6 ± 7.3 years). There were 47 males and 76 females. The main indication for surgery was the true O-shaped curvature (varus deformity) of the lower extremities. In order to improve the appearance and orthopedic status, additional manipulations were performed in the postoperative period (derotation, lengthening, etc.). Lengthening surgeries in this group were not the main issue. They include only cases of a combined varus correction with a relatively small lengthening, not exceeding 10–15% of the initial segment length. The lengthening magnitude was 1–5 cm. Additional procedures affect the timing of consolidation. Therefore, the period of fixation with the Ilizarov apparatus on was not considered as a criterion for evaluating the result.

In all cases, the main procedures of the operation were osteosynthesis with the Ilizarov apparatus and osteotomy of the tibia. Wires and half-pins were used as transosseous elements. The bone was transected with a 10–12 mm wide chisel at the level of 7–9 cm below the knee joint gap. Partial correction of varus deformity was acute, and final correction was performed in the postoperative period. Manipulations associated with limb lengthening were initiated after 5–7 days post-surgery.

To assess the main reference lines and angles (RLA), lower extremities were studied radiographically with the capture of the hip and ankle joints. From 2005 to 2015, computed tomography (CT) or connected radiographs of the entire limbs were used for these purposes. Since 2015, radiography of the lower extremities along the entire length was performed using special equipment, which provides high-quality long-length images up to 120 cm long (telemetric roentgenograms) [11]. Radiographs were used to determine the RLA relevant for correction at a given level: the mechanical axis deviation (MAD) and the mechanical medial proximal tibia angle (mMPTA) [12].

The results were assessed by satisfaction with the new shape of the legs expressed by the patients and evaluation of complications. In accordance with these criteria, the results were judged by three parameters:

1) subjective satisfaction, if the patient is satisfied with the results of correction;

2) subjective dissatisfaction, the patient is dissatisfied with the results of correction while the shape of the legs is ideal and there are no complications;

3) objective unsatisfactory result, which means the goal of correction was not objectively achieved according to clinical and radiological data, or complications developed in the course of treatment that required additional surgical treatment.

RESULTS AND DISCUSSION

In aesthetic surgery, there are a lot of things that are new and unusual for the clinician. In fact, the very key notions, "patient" and "treatment", change their meaning. The fact is that complex invasive procedures are performed in healthy individuals. Therefore, it is extremely important to substantiate the indications for surgical correction of the leg shape.

Conventionally, the average (neutral, zero) position of the mechanical axis with small (up to 3 mm) deviations inward or outward from the middle of the knee joint is considered the norm, and mMPTA is equal to 85–90° [12, 13]. This is one border, a conditional norm. Many healthy people have deviations from these RLA values which are externally manifested by the curvature of the legs in the absence of any clinical manifestations [14, 15]. They are potential candidates for aesthetic surgery. As for the other border that separates the norm from the pathology, then there is the only expert document to date for consideration, the Decree of the Government of the Russian Federation No. 565 on military medical expertise [16]. The first grade of not being able to military service corresponds to the deformity of the lower extremities measured by a distance between the condyles of the femurs equal to 12 cm, difference in leg length of more than 2 cm and rotation of more than 15 degrees [16]. In the absence of any other practical documents on this topic, deformities exceeding the indicated values can be considered as pathology and a clinical indication for surgical correction. In the existing health care system, the candidates for aesthetic surgeries are outside the compulsory medical insurance system and are treated either on a paid basis in public institutions or private clinics, licensed to work in traumatology and orthopedics. The ICD disease code is Q68 (other congenital musculoskeletal deformities).

Patients evaluate the appearance. In reconstructive orthopedics, the target is the skeleton. Therefore, in the process of preoperative examination, it is necessary to detect those deviations from the average statistical norm. They are potentially considered as an object of correction and the base to foresee how a change in the bone shape would change its appearance.

Table 1 shows the effect of the main correction elements on the position of the RLA and appearance.

In regard to the curvature of the legs, first of all there are associations with varus or valgus. However, a more in-depth examination reveals other types of bone deformities such as rotation, different length of the lower extremities, the position of the fibular head, etc. Osteotomy in the upper third of the tibia enables correction of the deformities detected by preoperative examination. Therefore, additional procedures needed and which might be implemented within one stage of correction should be discussed with the patient.

Table 2 shows the manipulations that were performed in the patients by correction of varus deformity (true O-shaped curvature).

The indications for osteotomy of the fibula deserve discussion. In aesthetic correction, there are no absolute indications for transection of the fibula. The fibula is actually a rudiment; it does not perform a supporting function. In corrective interventions, it is a spacer that hinders the manipulations with tibial fragments. Its osteotomy removes this obstruction. The fact that fibular osteotomy was performed in 136 (55.3 %) cases of this group is rather a tribute to tradition, and most of the cases belong to the early period of our work. Recently, osteotomy has been rarely performed, mainly in severe deformity (MPTA < 80º). In small deformities and, accordingly, small correction angles, the fibula may not be osteotomized. Contraindication to the breakage of the fibula is its bringing down in order to eliminate the subluxation of its head.

Among the additional manipulations performed in the postoperative period, the most controversial element is correction of angulation by medialization of the distal fragment of the tibia. The objective of this manipulation is to thicken the lower leg in patients with the so-called aesthetically uneven distribution of soft tissues. The amount of permissible medialization is estimated by different authors in different ways, from 5 mm to one half of the bone shaft width [2, 6, 8]. When performing medialization, it must be borne in mind that it changes the orthopedic status, increasing valgisation (the mechanical axis is shifted laterally, the MPTA increases). Moreover, the contact area of the tibial fragments reduces and it results in an increase in the consolidation time.

An important element of correction is rotation, correction of torsional deformity at the level of the lower leg. In this paper, we consider the correction at the lower leg level, which is manifested by the deviation of the foot axis relative to the longitudinal axis of the thigh in the sitting position (TFA, thigh-foot angle). The torsion can be both internal and external. Torsion at the thigh level goes beyond aesthetic correction and requires additional examination, including computed tomography.

Table 1

Influence of various correction elements on the appearance of the lower extremities and on the position of the main RLA in patients with varus deformity

Correction type	Effect on the lower limb appearance	Impact on the main RLA
Angulation	Approximation (closing) of the knee joints, considerable approximation of soft tissues in the area of gastrocnemius muscles, creation of the effect of tibial lengthening and femoral shortening	MAD shift to lateral side, increase in MPTA
Angulation with medialization	Shin thickening, approximation of soft tissues in the area of gastrocnemius muscles	MAD shift to lateral side, increase in MPTA
Rotation	Patella and foot coaxial correction	Correction of torsion (checked clinically or with CT), may change MAD and MPTA
Lengthening	Correction of difference between the leg length (if there is), change in proportions, stature growth	Inconsiderable impact on RLA
Descending the fibula	Elimination of protruded position of the fibular head on the lateral surface of the knee joint	No impact on RLA

Table 2

Main surgical procedures and postoperative correction

Operation elements and procedures	Number of surgical interventions (limbs)	
	Number	%
Operation elements		
Tibial osteotomy	246	100
Fibula osteotomy	136	55.3
Extraction of silicone implants	10	4.1
Elements of postoperative correction		
Angular correction	246	100
Angular correction with medialization	102	41.5
Correction of rotation	98	39.8
Descending the fibula	18	7.3
Lengthening	78	31.7

The clinical examples demonstrate the capabilities of the Ilizarov method for performing various correction elements.

Case 1 A 28-year-old female patient with varus deformity of the lower extremities, subluxation of fibular heads, external rotation of the right leg (Fig. 3) An osteotomy of the tibia was performed in the upper third, the tibia was lengthened by 1.5 cm, due to which the heads of the fibula descended in distal direction. In the postoperative period, the external rotation of the right leg was eliminated. The term of the Ilizarov external fixation was 5.5 months on the right and 5 months on the left. The radiographs taken one year after surgery, show MAD = -12 mm, MPTA = 90º on the right, and MAD = -3 mm, MPTA = 89º on the left. The patient is satisfied with the result, does not note any limitation of her physical activity, goes in for sports. There is a slight asymmetry (the right lower limb is valgized), which was a consequence of the difficulties in determining the shape of the legs while the Ilizarov circular apparatus was placed on the shins.

Difficulties in viewing the shape of the legs with the circular Ilizarov apparatuses on are associated with inability of complete closure of the feet. The solution to the problem is apparatus readjustment transforming it into a monolateral one with the possibility of closing the legs, as presented in clinical case 2.

Case 2 A 50-year-old female patient with varus deformity of the lower extremities (Fig. 4). Corrective osteotomy was performed and the deformity was eliminated with the Ilizarov circular apparatus. Taking into account the patient's high requirements for correction accuracy, the circular devices were readjusted two months after the operation. It was then become possible to close the feet and knees and evaluate the shape of the legs, which satisfied the patient. The external immobilization period was 3 months on the right and 3.5 months on the left. In the radiographs, taken one year after the operation, MAD = -3 mm, MPTA = 90º on the right and MAD = 2 mm, MPTA = 90º on the left.

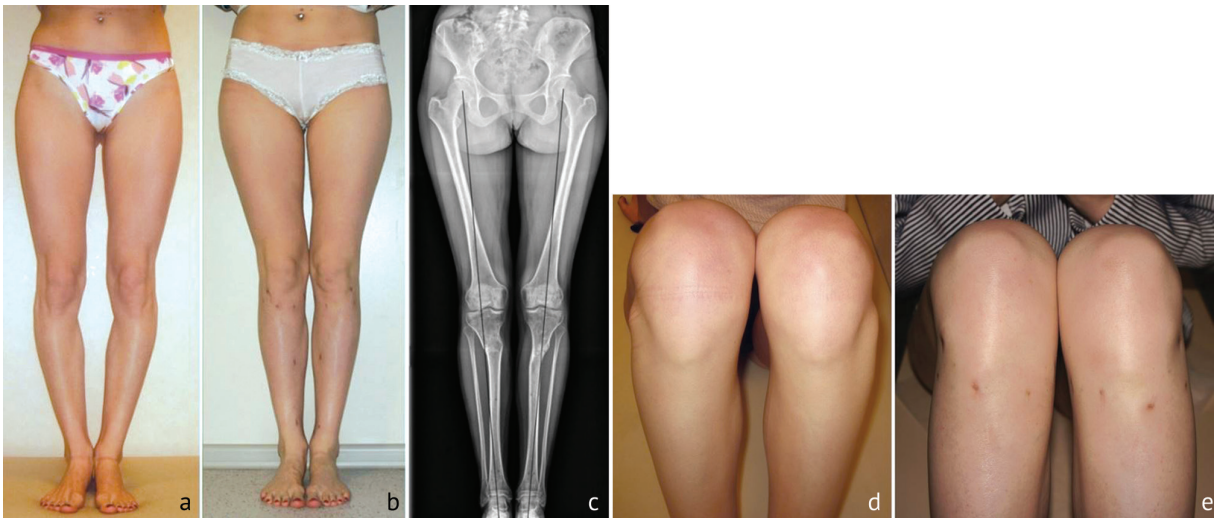

Fig. 3 A 28-year-old female patient with varus deformity, subluxation of the fibular heads, external rotation of the right leg: ***a*** appearance before surgery, there is a fusiform defect of the inner contour, external rotation of the right foot; ***b*** appearance 8 months after surgery (2.5 months after removing the apparatus); ***c*** radiographs of the lower extremities one year after surgery; ***d*** appearance of the knee joints bent before the operation with protruded heads of the fibula; ***e*** appearance of the knee joints after surgery with an even lateral contour, the heads of the fibula are not visible

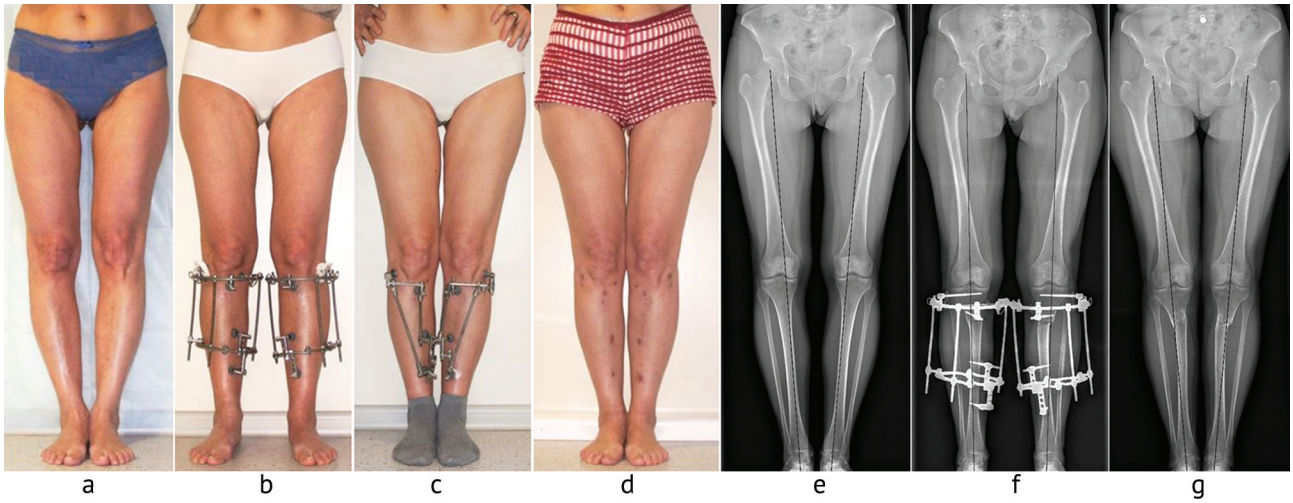

Fig. 4 A 50-year-old female patient with varus deformity of the lower limbs: ***a*** appearance before surgery; ***b*** during the correction with the Ilizarov apparatus; ***c*** photo 2 months after surgery with monolateral fixators on to approximate the feet to each other; ***d*** six months after the operation; ***e*** radiographs before the operation; ***f*** radiographs taken in the course of correction; ***g*** radiographs taken six months after the operation

The following clinical example reflects the problem of competition in the medical services market, when plastic surgeons performs contouring plasty in the case of true O-shaped curvature (varus deformity), which is not indicated in such cases. In our group, there were five (4.1%) such patients who had previously received silicone gel implants in order to correct the curvature. As a consequence, the patients were not satisfied with the result, and required orthopedic correction. In all those cases, the extraction of implants and corrective osteotomies were performed within the same surgical procedure.

Case 3 A 27-year-old patient with varus deformity of the lower extremities (Fig. 5). Two years prior, the patient had received silicone gel implants to correct the curvature of the legs. However, the goal of the operation was not achieved, and the patient was not satisfied with the result. The examination revealed varus deformity. Under spinal anesthesia, the implants were removed and osteotomies of the tibiae and osteosynthesis with Ilizarov apparatus were performed. The period of external fixation was 4 months on the right and 5 months on the left. In the radiographs taken 6 months after the operation, MAD = -3 mm, MPTA = 91º on the right, and MAD = 4 mm, MPTA = 90º on the left.

In our group of patients, corrective manipulations led to a change in the main RLAs: before treatment, MAD = 15 ± 7 mm, after correction MAD = -2 ± 4 mm; before surgery MPTA = 85 ± 4º, after correction MPTA = 91 ± 2º. Thus, there was some hypercorrection towards valgus following the correction of varus deformity in the group under consideration. To a certain extent, such a change in the RLA indicators was influenced by angular correction with medialization of the distal fragment of the tibia, which was performed in 51 (41.5 %) patients.

In accordance with the above criteria, the following results were obtained (Table 3).

The reason for the subjective dissatisfaction in 4 (3.3 %) patients was the discrepancy between the expected results obtained with the maximum approximation to the concept of the ideal appearance and the normal position of the RLA. However, two (1.6 %) patients after rehabilitation and restoration of muscle tone and soft tissue contour "accepted" the results of correction, two (1.6 %) other patients were operated on again in other institutions and treatment completed with an objectively poorer result.

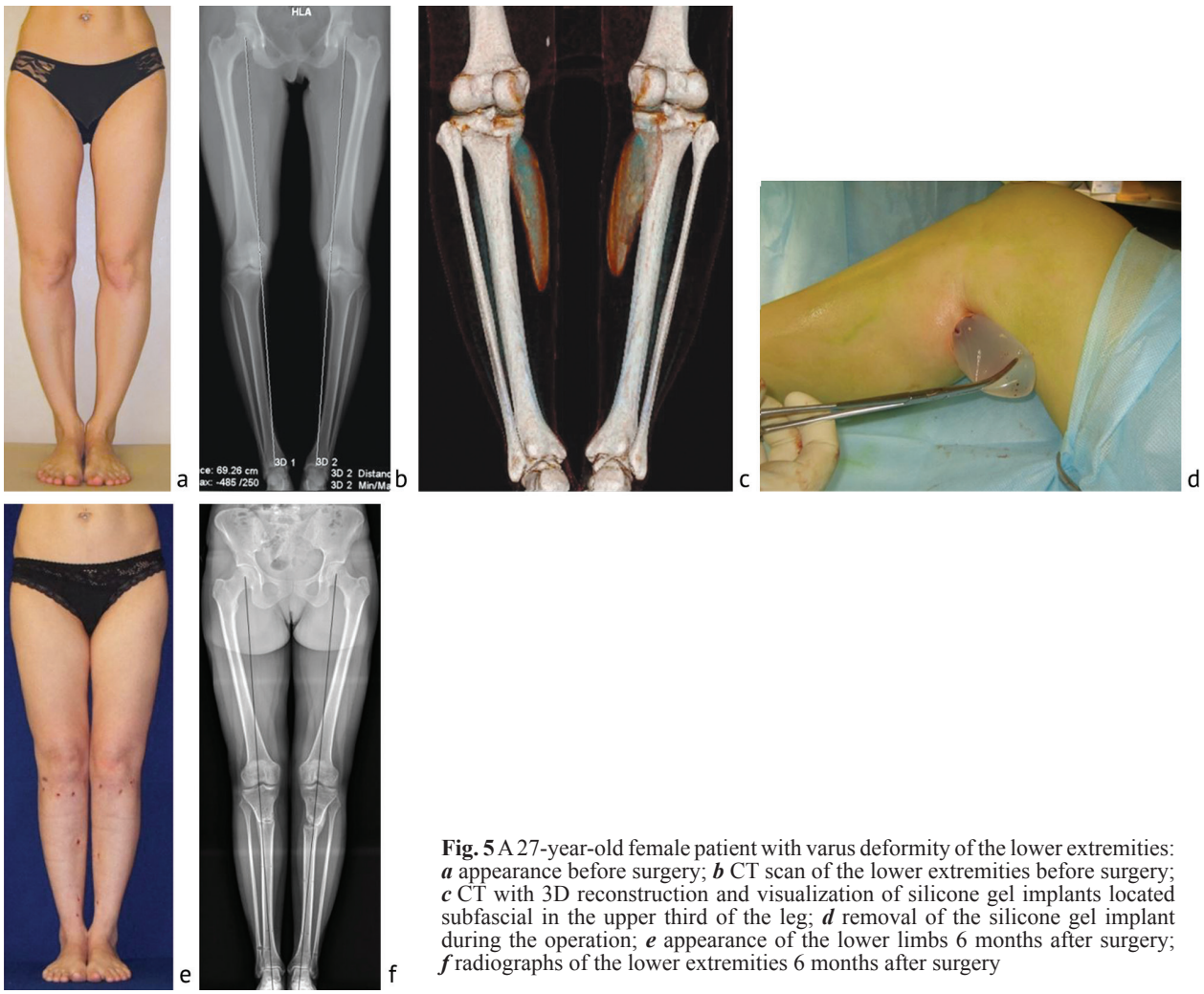

Fig. 5 A 27-year-old female patient with varus deformity of the lower extremities: ***a*** appearance before surgery; ***b*** CT scan of the lower extremities before surgery; ***c*** CT with 3D reconstruction and visualization of silicone gel implants located subfascial in the upper third of the leg; ***d*** removal of the silicone gel implant during the operation; ***e*** appearance of the lower limbs 6 months after surgery; ***f*** radiographs of the lower extremities 6 months after surgery

Table 3

Results of correction

Result	Patients	
	Number	%
Subjective satisfaction	114	92.7
Subjective dissatisfaction	4	3.3
Objective dissatisfaction	5	4.1

As for objective dissatisfaction, four (3.3 %) cases were associated with complications. Two (1.6 %) cases developed secondary deformity of the regenerate, caused by loading after dismantling the Ilizarov apparatus when regenerate maturity was still inadequate. One of these patients was re-operated, the other rejected the operation. Wire tract osteomyelitis developed in one (0.8 %) case that was cured. Nonunion developed in one (0.8 %) case in the area of fibular osteotomy which also required a repeated intervention. In one (0.8 %) case, after removing the apparatuses, asymmetry in the shape of the legs was found as a result of the difficulties in assessing the appearance associated with the inability of closing the knee joints in the course of fixation with the apparatuses.

DISCUSSION

Over the past decades, much has changed in the organization of care for various categories of patients. We have been accustomed to the concept of "medical service" in relation to clinical problems. It is time to get used to a broader concept, "medical services market" with its advertising, competition, consumer complaints, etc.

Aesthetic surgery of the lower extremities occupies a special place. It does not fit into the framework of plastic surgery, when one surgeon performs interventions in all areas of the human body. Operations on the lower extremities are operations on the skeleton (corrective osteotomies) which refer to the specialty "traumatology and orthopedics". However, this direction introduced a number of previously unknown and therefore unusual elements into orthopedics that significantly changed the role of the patient and the surgeon in the treatment process.

The patient may determine the indications, directly participates in correction, and evaluates the result. Even if the relations are friendly, there is a serious psychological pressure on the surgeon from the patient's part. Therefore, at the stage of selecting candidates for this surgery and at the initial consultation, an extremely important element is assessment of the patient's compliance and his motivation to overcome the difficulties associated with a long and painful correction process. The slightest doubt should make the surgeon abandon the idea of the operation. The communication with four (3.3%) patients who had subjective dissatisfaction convinced us that the best solution would be not to have performed the operation.

Another unusual thing is the choice as an object for correcting the appearance of the legs by indirectly affecting the skeleton. The data and clinical examples presented above in Table 1 demonstrate the capabilities of the Ilizarov method in achieving the desired result, but all this may be assessed to the full only based on one's own experience.

As for the orthopedic component, decision making about the surgery will be much easier if we consider this pathology as a factor predisposing to the development of gonarthrosis, and the surgery as its preventive procedure. There is a well-grounded opinion that varus deformity is one of the prerequisites for the development of degenerative lesions of the cartilage tissue of the knee joint [14, 17]. Exactly the same operations are performed with already developed arthrosis to optimize the biomechanics of the knee joint and preserve the resource of its functioning [18–20]. However, if we consider the problem from this perspective, then the performance of corrective operations for arthrosis should be considered a delayed measure while in patients without arthrosis but with deformity a timely one. Rather rigid requirement to the so-called norms within an insignificant deviation (several millimeters) of the mechanical axis from the middle position can significantly expand the indications for orthopedic correction. It should be remembered that in the market of medical services, plastic surgeons feel friendlier to such patients and are ready to perform plasty of contours in patients with varus deformity. This fact may be confirmed by the cases in five patients (4.1%) in whom we had to remove implants and perform corrective osteotomies.

Prevention of complications is an extremely important issue. The complications obtained in five patients (4.1%) were neither fatal nor irreversible. Elimination of the complications required additional interventions which ultimately resulted in a complete recovery with good aesthetic and clinical results. It shows high safety of the technique. The limiting factor is the decline in the quality of life during treatment. A partial solution to the problem is the use of wire-and-halfpin apparatuses with possible subsequent conversion of a circular frame into a monolateral one. Currently, this problem has not been finally solved and requires further improvement of external fixation devices.

The most important element is to obtain the outcome that would satisfy the patient. The uniqueness of the Ilizarov method lies in the fact that with the help of an external apparatus, it is possible to change the shape of the legs in accordance with the preoperative plan for at least 1.5–2 months after the operation, until complete consolidation occurs. This technique does not require complex preoperative planning as in internal osteosynthesis. We are the principal opponents of the preoperative leg shape modeling, which is currently possible with the help of special software. Modeling is a fixed picture. It can be used as a guide or demonstration of the method's capabilities. In the overwhelming majority of cases, the patients either perform the manipulations with the devices themselves, or the surgeon does adjustments it in accordance with the patient's requests. But at the same time, in no case should you impose your opinion on the patient. The doctor's voice in this case is advisory, with the exception of those rare cases when the achievement of the desired shape is possible only by a significant deviation of the RLA from the average norm. In order to avoid future claims, it is advisable to document such instances explaning to the patient of possible problems and the consequences of overcorrection in one direction or another. It is necessary to avoid violation of the normal orthopedic status up to the denial of the operation in cases where there is no mutual understanding with the patient about this point.

Many patients have a psychological disposition to achieve the desired (and predictable result) in the shortest possible time with the service and support available at modern plastic surgery clinics. During a long-term and painful treatment process of correction, patients start discussing the situation with other specialists or, what is much worse, with other patients in numerous on-line forums. Unfortunately, the excess of uncontrolled information that patients receive from various unverified sources on the Internet is a serious problem in building constructive relationships aimed at obtaining a good result. Some patients refuse to follow surgeon's recommendations, impose their opinion, which ultimately leads to complications or to a negative assessment of the result. Despite the fact that these situations have nothing to do with the "orthopedic" component, they have a serious and most direct impact on the organization of care for such patients and, most importantly, on the evaluation of the result.

CONCLUSIONS

1. Aesthetic surgery of the lower extremities is a part of orthopedics and has specific features due to patient's wishes about changing the appearance of the lower extremities indirectly by performing operations on the skeleton.

2. Corrective surgery in patients with varus deformity and without any other pathological changes in the knee joints should be considered as an intervention aimed at preventing gonarthrosis in old age.

3. The shape of the lower extremities has a direct impact on the function. Therefore, the position of the RLAs must be considered and their deviation from the average norm must be avoided.

4. The key to a good result is careful selection of candidates for the operation, taking into account their compliance, maximum possible explanation of the principles and features of correction, coordination of the patient's wishes by explaining the capabilities of the method with an emphasis on possible complications.

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