

Opinion N°82

Composite tissue allotransplantation (CTA) of the face

(Full or partial facial transplant)

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On February 19th 2002, Doctor Lantieri of the Henri Mondor (AH-HP) Hospital, referred to CCNE concerning the ethical issue of vascularised composite tissue allotransplantation of the face.

In support of his request, he submitted a report called “*Cutaneous allotransplantations – ethical and medical issues*” so as to “*initiate a discussion on problems which may arise following reconstruction of the body image*”.¹

The present Opinion is only concerned with the possibility of full or partial facial reconstruction by composite tissue allotransplantation, for people who have suffered disfigurement following accidents, burns, explosions, or disease. It does not deal with plastic surgery which aims to improve physical appearance in the absence of initial trauma or disease.

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I. Current status. Surgical data

1. Autotransplantation and allotransplantation

a – Autotransplantation

1

Reconstructions using tissue *autotransplantation* are the foundation of all current reconstructive plastic surgery. Because of such transfers, it is now possible to reconstruct complex components of the face, the limbs, or of the trunk. Indications vary and loss of substance may be due to trauma, malformation, or surgery in the case of tumour resection.

These autotransplantations, commonly called *free flaps*, may be simply cutaneous so as to cover cutaneous loss of substance; but it is also possible to transfer more complex components such as a muscle in order to reconstruct a function (in the case of facial or upper limb paralysis) or a bone segment, cellular and fatty tissue with skin, or a combination of the above.

b – Allotransplantation

Composite tissue allotransplantation (CTA) involves harvesting tissues from a brain-dead donor, in the same way as for any organ transplant, i.e. harvesting all the tissues required for the reconstruction of a given area and the corresponding vascular and nervous components. Immune incompatibility between donor and recipient is the reason for “life-long” immunosuppression treatment for the recipient. The potential secondary effects of this treatment are well known.

Furthermore, unlike *transplanted organs* (liver, heart, kidney, etc.) composite tissue grafts – of which the hand or a complete limb are the most advanced examples – are histologically heterogeneous, and made up of tissues that express different degrees of antigenicity, including the highest degree (skin and muscle). They contain immunocompetent elements (bone marrow, lymph nodes) that are potential agents of an immune reaction.

This is a recent surgical procedure, which began in September 1998, when a surgical team in Lyons, directed by J.M. Dubernard, operated on a 48 year old man whose right hand had been amputated, and grafted a forearm provided by a man aged 41 in a state of cerebral death. The long-standing technical expertise of the best hand-surgery units, who have performed frequent *replantations*, had led – as some will no doubt recall – to criticism regarding the acclaim as a *technical exploit* given to the Lyons’ team first performance. It was not only the surgical act itself that deserved acclaim, but also the expectation of controlling the immunological reactions to reconstructive allotransplantation involving composite tissue graft.²

2. Allotransplantation requires lifelong immunosuppression treatment

² CCNE, to whom the “Direction générale des hospices civils de Lyon” had referred, had expressed some reservations as regards the personality of the patient, justification for the procedure, and an overly limited approach as regards expected results, in particular neurophysiological. Since then, other hand grafts have been performed and also other anatomical areas have been transplanted. The second bilateral graft performed in Lyons by Professor Dubernard, which took account of CCNE’s comments, which the health authorities endorsed, turned out to be an authentic success.

Because of the presence of tissues (a considerable amount of skin, muscles, and sometimes bone) that express the highest degree of antigenicity, allotransplantation of all or part of a face signifies exposure to maximum risk of rejection, unless the availability of effective, but also lifelong, immunosuppressive treatment, is assured.

In this connection, very encouraging progress has been made in recent years. This has been demonstrated particularly by the allotransplantation of “hands” since September 1998.

The most recent document published by the Royal College of Surgeons of England³ in November 2003, reported to date 21 hand CTAs, 9 abdominal wall transplants, a laryngeal transplant, and one tongue transplant.

No facial CTA has yet been performed, despite the insistent requests from several surgeons who consider that they have now acquired the technical expertise required for this kind of procedure. It is true that the risk of early vascular necrosis of the transplant is now minimal because of the use of very effective microsurgical techniques. However, there is no evidence that immunology problems are a thing of the past. That being so, the risk of acute rejection after this type of facial graft can be reasonably estimated at 10% during the first year, and the risk of chronic rejection after 5 to 10 years is 30% to 50%.

Furthermore, even the most competent immunosuppressive drug strategy, also entails its own specific well-known risks, such as vulnerability to infection, arterial hypertension, diabetes and malignant lymphoproliferative disorders, and skin cancers which are particularly threatening in these circumstances.

3. Is CTA facial reconstruction possible?

Facial transplantation was discussed as a genuine therapeutic option at the Plastic Surgical Research Council conference in Boston (USA) in April 2002.⁴

In January 2003, the Figaro daily newspaper published a report of the meeting at which the Lyons unit confirmed excellent results two years after performing a CTA of both hands. The information was also given that in Rome, a surgeon had successfully performed a CTA of the mandible on an 80-year-old patient diagnosed with oral cancer (he died a few days later). The journalist continued : “After transplantation of both hands, of the jaw, several surgical units are now considering transplanting the faces of cadaveric donors onto severely injured burn victims”. (*Le Figaro*, 20.01.2003, p. 12).

The Royal College’s report, following the media attention given to Dr. Butler’s statement to the British Association of Plastic Surgeons in December 2002, expressed grave reservations and pointed out that when the face is involved, reconstructive surgery is not just another routine procedure.

Nevertheless, some specialised reconstructive surgical units are still eager to perform facial CTA.

³ Kmiotowicz Z. Face Transplants should not be done without more Research *B.M.J* -2003 (327) nov 22, p1185

⁴ Hettiarachi and Butler (...) referred to this in an article published in July 2002, entitled : Hettiarachy S., Butler P.E.M. Face Transplantation-Fantasy or the Future *The Lancet* -2002 (360) July 6-pp 5-6 ; initially ignored by mass media, this article emerged a few weeks later with sensational headlines: “Living with someone else’s face”!, “Get a new transplanted face!” (France-Soir, 30.11.2002), " A British surgeon’s discovery?”, or more seriously, “For the disfigured: a British unit is considering facial transplantation”(Quotidien du médecin, 2002-7332-4, Dec. 2002, p. 15). Louis C. “Transplants, after the hands, the jaw”. Extreme surgery disturbing. A French unit wants to transplant a face. *Le Monde* , 24-01-2003 p 12

They point out that, from a strictly surgical point of view, harvesting tissues from a donor in a state of cerebral death has several advantages which free the surgeon from the principal constraints of traditional reconstruction and provide optimal technical conditions. Above all, CTA satisfies the supreme objective of any tissular reconstruction : achieve identical replication. For that matter and for the sake of semantic precision, this type of surgical activity would be better described as tissular *replacement* rather than tissular *reconstruction*. Another major advantage of allografts is the absence of morbidity connected to tissular harvesting at the donor site, so that the surgeon is spared the predicament of the *destruction of healthy tissue*, which is the counterpart of any autologous tissue reconstruction.

These arguments which are worthy of consideration for certain possible indications of CTA, in particular amputation of both hands, would probably need to be viewed in a different light as regards the use of CTA techniques for the face. The surgical technique is relatively straightforward, with suture of a few vascular and nerve pedicles. It is not, properly speaking, a major technical achievement.

Leaving aside for the moment the need for immunosuppressive treatment, which will be dealt with later, it would seem to be more sensible to limit ambitions for the use of CTA to restoration of one of the anatomical units of the face, for the purpose of repairing late-onset, local, and intractable outcomes, despite generally acceptable initial repair.

II - Current indications for facial reconstruction

Fortunately, these are now relatively few and far between. CTA indications could theoretically include ballistic trauma, severe burns, facial cancers, and some congenital deformities.

1. Ballistic trauma

Ballistic trauma, either in wartime or civilian life, has become rare.

a – In war

Warfare has evolved with time. However, the main difference is that early management of the wounded has completely modified the outcome of facial injuries. For a long time, they were considered to be incurable and more often than not, these casualties were left on the battlefield and were only rescued at the last if they had survived through the initial hours. In the circumstances, their wounds were aggravated by haemorrhage and infection with, as a result, increased tissular necrosis and therefore loss of substance. Nowadays, instructions to the medical units of the armed forces are that soldiers with facial wounds are pulled out as a priority. Immediate management of haemorrhage, breathing, and swallowing secures survival and prevents infection. The result is maximum conservation of facial tissue. This being so, all the techniques of modern reconstructive surgery can be put to good use by specialised surgeons in hospitals away from the combat zone, where the wounded are rapidly transported under intensive care appropriate to their condition.

Techniques used there may well include the most modern composite autotransplantation microsurgery, either immediate or deferred, and it is worth underlining that in this case there are no immunological complications.

Results have become very satisfactory and there is no comparison with the situation which prevailed until the early part of the Second World War. Furthermore, the ease with which polymer implants or external prostheses can be used and their cosmetic qualities are such as to produce high quality restoration. This, with the assistance of appropriate psychological counselling, helps to minimise social and psychological problems.

b – In civilian life

A frequent method of suicide is still to shoot into the mouth or under the jaw. The resulting damage is particularly destructive, involving the jaw, the tongue, and the nasal fossae. Functionally, the consequences of such destruction are severe. Sadly, the psychological status of suicidal people is particularly fragile and unstable, so that they may be unlikely to commit themselves to long-term uninterrupted immunosuppressive treatment which is a necessary, but severe, constraint. The first experience in Lyons of CTA of the hand was very edifying in this regard. The patient was not very compliant and was reluctant to accept close supervision, so that rejection occurred and amputation became inevitable. Therefore, it seems very hazardous to offer CTA from the outset in this kind of situation, although technically it would certainly be advisable. Consideration as an alternative indication, because of the impossibility or failure of conventional restorative surgery, adds to the other reservations mentioned above the technical difficulty of operating on retracted or rearranged scar tissue.

2. Facial cancers

The treatment of facial cancers still currently involves mutilating and extensive ablative surgery. Cancer units do not hesitate to perform immediate complementary restorative *autotransplantations* using composite tissues, in particular the fibula with its vascular pedicle, so that bone, muscle, and skin can be supplied. In spite of added technical difficulty due to prior radiotherapy and the exacting associated chemotherapy, the objective is only short term in order to give some measure of functional comfort and above all moral solace to patients whose life expectancy is – alas – limited.

In these circumstances also, it does appear that composite *allotransplantation* is not an option.

3. Extensive facial burns

Treating major facial burns by *allotransplantation* of a face harvested from a person in a state of cerebral death may seem to be an attractive option. However, although problems as regards obtaining skin do not appear insuperable, the problem raised by the complex innervation of the multiplicity of small facial muscles is far from settled. It is true that re-innervation of the hand by suturing the large nerve trunks of the forearm as achieved in the second case in Lyons was encouraging. However, it is in no way a precedent when hoping to obtain restoration of facial expressions.

In the case of severe facial burns, all the experts agree that it is best to spare as much of the facial muscles as is possible despite their initial carbonised appearance,

and to be very conservative as regards early tissue resection. Nowadays, the skin, construction of the lips, the eyelids, the cheeks, and even the nose, can be appreciably improved with the use of modern repair surgery techniques, plus if required, various well tried procedures such as cutaneous expansion, fatty or prosthetic implants, and reconstruction of the nasal pyramid.

If facial CTA was chosen as the procedure to repair a face bearing extensive burn scars, then it must be kept in mind that grafting would demand a total resection of the scar tissue which frequently was achieved only with some difficulty. This means that should some technical difficulty arise with early tissular necrosis, or even early rejection, the entire allotransplant would need to be removed, after which there would have to be a succession of conventional procedures for cutaneous cover, the results of which might well be worse than the point of departure.

4. Some congenital malformations of the face

Some extremely rare congenital malformations deform the face of a child to such an extent that replacement by CTA could come to mind.

a – In fact, these malformations are local, although they may be extensive (tissue dysplasia, angioma, giant *naevi*, tumours such as teratoma, etc.). Even very young children can also benefit from appropriate techniques using exeresis extensively and prior cutaneous expansion of the donor area to obtain the autografts needed for reconstruction, after exeresis - possibly progressive - of the malformed areas.

b – CTA repair for certain facial deformities as observed in a few rare cases of complex malformative syndromes (Proteus syndrome, Recklinghausen's disease) would not suffice to achieve a normal physical appearance. Considering that furthermore life-long immunosuppressor treatment would have to be prescribed, the indication would be ill advised.

III. Ethical issues regarding the human face

Ethical issues related to a possible facial transplant cannot be approached until one has considered what it means for a human being to be in possession of a face. It is a universal feature of the human condition and is the root of self-perception and relationship with others that are essential to life in a social environment.

The social and historical aspects of human facial perception cannot be ignored. Cultural dimensions, and possibly an irreducible portion of the imagination, are associated to the way in which our cultures conceive and appreciate the human face. The thoughts outlined below attempt to highlight the ethical significance of the human face and the modifications to which it could perhaps be subjected. These reflections inspired a set of recommendations regarding the possibility of grafting a part or the whole of a face. Efforts were made to avoid any preconception, to steer clear of any moral discourse, and to discriminate between issues that require a decision and those which need to remain open.

Possession of a countenance conditions self-awareness; it is also one of the foundations of intersubjectivity. To possess a face therefore has a collectively

recognised ethical significance. This must be made clear as a preamble to the definition of ethical problems arising out of the loss of a face and hopes of full or partial reconstruction.

1. The ethical significance of the human countenance

a. The unity of the countenance

Two traits characterise the face: uniqueness and expression. That which defines the human countenance is first of all the harmonious and quasi symmetric arrangement of its characteristic features: two fairly horizontal eyes, a vertical nose, a horizontal mouth; all of this set in a more or less oval form, with ears on either side. This is called the mask or the triangle. It is sufficient to outline those features without adding anything else at all for anyone to recognise a human face. Sketches or caricatures are often restricted to those few lines to signify a face. Of course, this prototype allows for alteration. Eyes can be exaggeratedly large as in cartoons, the nose can be tiny, the mouth shown as a single line – nevertheless, the simple suggestion of these features is sufficient to convince our brain that we are in the presence of humanity. Hideous masks representing deformed faces disturb and twist these elements, but they keep their general shape and their relative positions.

Furthermore, the face is always someone's face. As the philosophers put it, it is a form of being of man. It relates to individuality. It is made up of this particular arrangement, unique every time, of eyes, nose, mouth, and the shape of the countenance, which gives reality to an incarnation of the human being. There is no such thing as a universal face. Masks for the theatre are the shape of a human face, but no one would confuse them with a human face. *One* face cannot be the generality of faces, it is *the* particular face of someone, the face of a single individual who has that face and is the only person to possess that face.

The face is what at first glance identifies a person as a matchless individual. When we discover a new face, we experience compellingly that it is unique, that no other individual except the one we contemplate can show the same face. Of course, identical twins resemble each other to the extent that they may be mistaken one for the other. But anyone who knows them really well will be able to differentiate between the two, because although their faces are identical, they do not inhabit that identical face in the same way, since they are two distinct individuals. This is also true of the very rare examples of total look-alikes.

b. The face, expression of a personality

The face is also the expression of the personality of an individual in its most singular form. Faces are rarely still and inexpressive. The features move, often harmoniously, and they display emotion and attitudes. This capacity to be expressive is what makes the face the *medium* through which human singularity is displayed.

In this way, the human face is visibly different from an animal's muzzle or snout. It can no doubt be said that an animal's countenance expresses feelings. But we humans are mostly able to recognise the forms of expression that are human and not very clever at recognising those which are peculiar to animals. In fact, we identify a face also by its capacity to move, to smile, to blink; in a word, to express the attitudes and the sensitivity of a person.

c. The face: foundation of the relationship with others and with ourselves

Finally, the face is a fundamental element of our relationship with ourselves and with others. For that reason, its ethical significance is obvious.

Two thirds of our communication with others is processed through the non-verbal channels of expression of the face. Facial expression depends on a complex coordination of nerves and muscles which we need so as to establish and maintain a proper relationship with others. Recent studies have shown that our capacity to display a facial expression has an immediate impact on our feelings. It has been noticed that the mood of people who are incapable of forming real facial expressions tends to deteriorate.

The face is the first basis for recognising other people. Not only do we apprehend others in the form of a set of features which belong only to a particular person; we recognise that other as human by his face. A true relationship of intersubjectivity is immediately established. The philosopher Emmanuel Lévinas notes that the face is the true form of others, and the first route of access to otherness.

The very morphology of another's face is not perceived in a neutral fashion. We never cease to project psychological qualifications onto the set of features which form the face. We say that a face is open or closed, intelligent or stupid, generous or mean. Many people believe that a face is a reflection of a person's morality. Such judgments may be hasty or nourished by prejudice, but the essential point here is that seeing a face is frequently associated with understanding the entire personality.

The face also constructs our relationship to ourselves and plays a decisive role in the making of an identity. The face is what we come into the world with. It is a marker of our genetic heritage from generation to generation. The face is obvious evidence of our relationship with our families. At least in Western cultures, the face is always visible. It is perceived as the most exterior part of a person, what is presented to the world before anything else, that through which others have access to ourselves. The experience of veiled women, when their faces are concealed, is probably different in this respect. However, when these women are with other women, or with their husband and their children, and discard the veil, their experience is presumably identical to that of all human beings, i.e. to present themselves to others through their face, and to be understood for what they are, primarily by their face.

d. The impossibility of seeing one's face

The relationship between a human being and his own face is worth investigating. In fact, people cannot see their faces unless they are close to a reflecting surface. They can feel the face, touch it, guess at it, but in order to see it, they have need of a mirror to give their face the same look that others see. In the antique story, which Ovid relates in the *Metamorphoses*, the seer Tiresias had promised that the young and beautiful Narcissus would survive as long as he did not know himself, and therefore did not know his own face. To avenge the nymph Echo, abandoned by the young man, the goddess curses him: Narcissus will love but never possess what he loves. What follows is familiar. In a pool of water from which he seeks to drink,

Narcissus glimpses a face so beautiful that he is enthralled and immediately falls in love with it. This face, which he does not recognise as his own and cannot grasp, condemns him to despair and inevitable death.

This ancient legend is very instructive. As we are unable to see our own face, we have to rely on mirrors, natural or manufactured, to get to know ourselves. But this recognition is not passive. Before we look anew into a mirror every morning, we already have some anticipation of what we shall behold: a representation of that face, fashioned by the innumerable previous occasions on which we have seen it. However, if it so happens that the face that the mirror reflects does not correspond to that anticipation, we are just as likely to think: “this is not me”, at least as much as: “so, this is me”. When a person whose face is momentarily deformed (by dental surgery, allergic reaction, a blow, or trauma, or even at a time of great weariness or because there is some reluctance to accept ageing features) looks into a mirror, surely the first thing that comes to mind is “I do not recognise myself. This is not me”.

2. The sorrow of no longer having a face

a. Marring of the relationship to self

When a person's face is severely damaged, through a loss of facial substance, by a gash, or multiple trauma, there is the feeling that somehow the face is lost. It is then said that the person is disfigured, no longer has a face, or even no longer looks human. It is such a necessary characteristic for the human face to have a symmetrical whole arranged in a certain order, that the absence of one feature may cause the loss of the entire structure. Major trauma to the face, and the loss of what the person concerned registers as his face, cause immense suffering, physical no doubt, but above all psychological. This is because the relationship to self, the sense of identity, and also relationship to others, are all enormously hurt by this kind of accident.

Loss of a person's face severely disrupts the sense of identity of that person. We mentioned to what extent the mental representation an individual has of his face underlies every occasion of seeing it in a mirror. The importance of this mental representation, partly archetypal, of his or her own face that everyone seems to possess should not be underrated. Its reality enables us to understand the pain of those whose face has been lastingly marred following an accident or surgery. Such people find it very difficult to accept that the face reflected by the mirror is their own. Their face, in their mental imagery, is still the face they had before the accident, or before the operation. This is particularly true when not only the symmetry of the face is destroyed, but also its characteristic design: the shape of the eyes, the relative arrangement of eyes and nose. This kind of difficulty in recognising oneself is compounded when the expressive capacity of the face is partially or totally lost. The face then seems to be an alien mask that no longer conveys the expressive intent of its owner.

b. Deterioration of the relationship with others and rejection by others

Losing one's face also severely disrupts relationships with other people. The disfigured not only cease to recognise themselves, they are also ashamed of their face. Their first reaction is to hide, and to conceal themselves from the gaze of other people. The probable cause of this reaction on the part of disfigured people is firstly the apprehension that others will see them as they see themselves. However, this reaction is also explained by the fact that very generally there is a quasi-instinctive

rejection to disfigurement. An ordeal of this nature is often experienced as a form of social death.

Since such rejection is one of the major causes of suffering for disfigured people, it is worth considering what could be its origins. The work of cognitive psychologists has shown to what extent the human eye is naturally expert at perceiving and discerning almost immediately any dissymmetry or abnormality in a face. The slightest defect or disproportion is immediately noticed. Also, the human eye has a very low tolerance level, if you can call it that, as regards any facial deformity. Some faces, which we perceive as abnormal, disturb us, but our immediate reaction is more often than not, to recoil, when we perceive not just abnormality, but also deformation (an eye askew, no jaw, a totally broken nose, a missing ear). Of course, we admonish ourselves and we learn to accept, but it is still true that our reactions seem to be that when we perceive a human face, there is always an expectation of recognising the archetypal form of the face. When deformation is so great that the form no longer exists, there is an acute perceptive discrepancy, and we cannot stifle an immediate reaction of rejection.

It is a constant of human civilisations to hide monsters, or to only leave them a restricted space in the margin of society. The world of antiquity cast all its monsters outside the pale of society, as lawless beings (this is the case of Cyclops, Medusa, Argos the many-eyed monster). The medieval world kept its lepers outside its towns, and when their passage was announced, people deserted the streets. Abundant romantic literature was inspired by tales of men and women with burned faces, for ever concealed under leather masks.

c. Changes in collective reactions to disfigured people. The lessons of World War I.

There are still, alas, in our societies extreme reactions rejecting disfigured people. However, in recent times, these seem a little less common. Firstly, because disfigurement of this kind due to disease, is now increasingly rare. Such cases are observed at birth, or appear during development. As we have already noted, this can be tissular dysplasia, a Proteus syndrome, or Recklinghausen's disease. Furthermore, in such cases, it would seem that public opinion has grown more accustomed to this type of infirmity, acquired perhaps in part by the success of David Lynch's film, *The Elephant Man*.

However, it is mainly in the collective perception of facial disfigurement due to wounds or surgery that public opinion seems to have evolved. Certain people, in today's world, lose a part of their face because of ablative surgery for cancer of the jaw, or other causes. Such surgery did not exist in former times. These surgical procedures now seem more familiar to public opinion, which is why perhaps there is more compassion.

That apart, the major cause of disfigurement is now trauma, either in war or by accident. The decisive experience of World War I in this respect is very pertinent, and it was one of the reasons for a change in attitude. The large number of injuries to the head and face during this war was due to the fact that weapons were no longer mainly the sabre and the rifle which were replaced by artillery, so that shells devastated human bodies and shattered faces. During that war, new kinds of facial wounds appeared: irregular, extensive, with considerable devastation of faces. It was in those years that the first reconstructive surgery techniques were developed. The "*gueules cassées*" (literally: the "broken faces"), about 100000 head and facial wounds, created a reality which made a lasting impression on the nation's collective

memory. As they were sometimes rejected by their friends and families or by society, they managed to create a competent network for mutual support and collective structures. This was in fact the origin of the French National Lottery and it was within that network that they were able to find an alternative social role. These structures for support were initially developed as a sanctuary from the outside world so quick to reject them. These soldiers have now gained complete recognition as authentic heroes whose wounds were of quasi-sacrificial dimensions. There is real compassion for them and feelings of solidarity on the part of public opinion – of which the success of a recent film, *La Chambre des Officiers* * (*Officers' Ward*), is ample evidence.

It is true that in today's Western world, war and conflict are infrequent and do not generate a great number of victims. Most of the membership of the "Gueules Cassées" association who are still living, are the wounded of the Algerian war, and all are men, with one exception. However, it does seem that our society is increasingly vulnerable to acts of war of a new variety: civilian terrorism. The victims of terrorist bomb attacks, pierced by a deluge of screws and bolts, are unfortunately likely, in coming years, to add considerably to the ranks of those suffering from head and face wounds, of both sexes.

d. The resources of identification and compassion

This same blend of quasi-instinctive rejection and compassion, which is notable as regards facial wounds, also exists in the case of people disfigured by accident. Domestic or agricultural accidents, car accidents, many are the circumstances in which people can lose a part of their face. In the life of human beings, such an accident is a tragedy that radically modifies their relationship to themselves, to others, and also their future prospects. Probably because there is fairly general feeling that such an appalling misfortune can happen to anyone, and indeed to oneself, some hesitant form of collective acquisition of tolerance seems to be evolving in public opinion.

Another situation is now sadly a purveyor of disfigured individuals: unsuccessful suicide. Such cases are particularly tragic, because victims are in a state of profound psychological distress, and therefore particularly sensitive to any form of rejection that comes their way.

However, it is worth mentioning that, contrary to general opinion, recent studies have demonstrated that the extent of psychological damage following a facial accident is not in direct proportion to the extent or to the severity of the injury. Some of the more severely hurt accept their disfigurement to some degree. Others, more lightly injured, take it very badly. It would seem that human beings all have a special relationship to their physical appearance and are more or less capable of bearing mutilation. There is no doubt that people who suffer the most from injury to their face will seek out all the possibilities of improving their appearance and will perhaps be more inclined to invest hope in possible reconstruction. For such people also, a mediocre outcome, not to mention failure, at the end of a reconstruction attempt will be particularly difficult to accept.

Apart from the possibility of facial reconstruction, psychological assistance techniques have been developed for the purpose of helping disfigured people to overcome their loss of self-esteem and confidence, and their depression and anxiety.

* Produced by François Dupeyron (adapted from a novel by Marc Duguain); see also the work by Sophie Delaporte, (*Gueules cassées*).

IV. Ethical issues regarding the use of CTA

1. The demand for facial reconstruction

a. The aspiration to regain a face

The struggle to regain a face represents another dimension, which includes an element of hope, of the suffering of disfigured individuals. There again, the experience of World War I and the literary and film adaptations that dealt with the subject recently, have awakened public opinion to a full appreciation of the brave determination of the wounded and the dedication of surgeons.

In a film made by Georges Franju in 1960, *Les Yeux sans visage (Eyes without a Face)*, most of the ethical issues connected to an operation of this kind are raised. The daughter of a famous surgeon is disfigured in an accident. Her father makes several attempts to graft her with the faces of other young girls that he kills and mutilates for that purpose. Repeated failures and the girl's own revolt lead her to commit suicide and provoke the death of her father. In this film, which presents the notion – technically an impossibility – that regaining an intact face is a realistic option, most of the ethical issues connected to the hopes of plastic reconstruction are brought up: refusal of solitude and rejection, the difficulty of obtaining a graft, the impossible process of recognition of self for the girl who has received a new face, wretchedness and uncertainty when the graft fails.

Many facially wounded individuals want their own face back. In the present state of surgical art, this is an impossibility. The only option on offer is to regain an approximation of a face. As we know, autotransplantation provides that to a certain degree. But the result is never fully satisfactory as regards the unity and the harmony of the reconstructed face. Furthermore, it must be said that the repeated and painful surgical procedures involved are difficult, and sometimes a disappointment. Even though it may happen that the prospect, several times over, of a new and more effective operation contributes to providing psychological support, and seems to maintain a glimmer of hope in the patient's mind, at some point the time comes when the surgeon must say: “we can do no more”, or “we cannot go any further”.

This is why hopes are raised by the possibility in the near future of arriving at more satisfactory reconstructions by the allotransplantation of composite tissues for part or the whole of a face.

b. The validity of hopes for reconstruction

An examination of the ethical aspects connected to practising facial CTA raises from the outset the issue of how valid are patients' hopes of reconstruction, and what reasonable expectations they can entertain.

In the case of severe burns, the main treatment available at present (graft of skin or flaps) in most cases does not lead to very satisfactory results from a cosmetic point of view, and there is loss of functionality with deep scarring and almost total absence of facial expression. The prospect of composite tissue allografts would provide the hope of reconstituting an almost normal face and also perhaps improve mobility.

However, it is still very difficult in the present state of research, to predict the final look of a face after partial or full facial allotransplantation. Studies carried out

on the basis of computer aided modelling suggest that the result would resemble neither the donor's face nor the recipient's before the accident, and that it would derive most of its characteristics from the recipient's bone structure. There is also reasonable hope that some form of expressive mobility could be regained, but this depends on the gravity of existing scarring on the face before surgery. However, there is reason to believe that mobility would be improved compared to what would be obtained by autotransplantation for the same face.

Hopes of regaining a face explain that in view of the demand for reconstruction, and of the difficulties and disappointments that sometimes accompany the use of autotransplantation techniques, the purely theoretical possibility that we are considering, i.e. getting a graft of an entire face or of part of it as a substitute for the one that was lost, remains very tempting. Disfigured individuals could in this way regain an acceptable and reasonably mobile face.

However, as regards the possibilities of success of the graft, there is no follow-up available to provide the slightest reassurance to patients. Evaluations of the chances of success of such procedures indicate the persistence of a fairly high rate of failure. Nor can the possibility of delayed failure after apparent immediate success be rejected.

c. Current status regarding the demand for reconstruction

It is extremely difficult to ascertain with any precision the number of disfigured people who would, as of now, in France, wish to benefit from a CTA procedure. The indications given by the reconstructive surgeons who were auditioned, lead us to believe that few patients would wish to do so in the present state of advancement of research.

The author of the referral, mentioned one single possible candidate. Following a failed attempted suicide, the entire lower portion of this patient's face was torn away. Autotransplantations after the accident have so far only produced fairly mediocre results. However, not only is the patient psychologically fragile and vulnerable, but also the risks (delayed rejection, disastrously serious consequences in case of failure, burdensome post-operative treatment) would appear to be disproportionate in relation to hopes of cosmetic improvement.

Military doctors whose opinions were heard, stated that they did not know of any patient who might wish (again according to those doctors) to benefit from these new graft possibilities if they were informed about them.

However, it was clear that doctors themselves wanted to see such procedures done, by others or by themselves. Surgery owes some of its recent developments to the fact that a surgeon has found himself in some particular situation that demanded an entirely novel act of surgery. In itself, this quest for pioneering surgical action is completely acceptable, and is evidence of a totally honourable eagerness for surgical innovation on the part of the medical profession. However, it cannot be a substitute for the actual demand from disfigured individuals.

In the following ethical discussion, there is no attempt whatsoever to make any value judgment on the actual fact of proceeding with the reconstruction of a face, nor any moral appreciation regarding the desire to benefit from this kind of surgical procedure. Our pursuit is strictly of an ethical nature, i.e. provide elements of evaluation regarding the various components of the problem which would seem to us to have ethical value, and to weigh them against each other.

Therefore, after taking account of the very real risks incurred by the patient, of the evaluation of the patient's reasonable expectations, of the quasi impossibility of securing informed consent, of the dramatic situation in which patients would find themselves in case of failure, of the psychological impediments to a totally successful graft, and also of the relative difficulty of obtaining grafts and of finding a match, there seems to be sufficient reason to justify our final reservations regarding facial CTA.

2. Difficulties as regards the decision to operate, providing information, and obtaining consent

a. The decision to operate

Before taking the decision to proceed with surgery, doctors must be certain that a patient will be able to tolerate the risks of surgery and the constraints (treatment, diet, lifestyle also) that may ensue. They must also be able to evaluate the practical and emotional support that the patient's family and friends are able to provide.

An initial ethical requirement would be to inform the patient with as much precision as is possible of probable results and the difficulties in achieving them. This requirement is all the more fundamental because many works of fiction or films, and also rather superficial information circulated by several newspapers, let it be thought that it would be possible, in particular with the help of partial or full facial allotransplantations, to produce a face identical to what it once looked like.

It could happen that, even fully informed of the risks inherent to the operation, the patient might still want to proceed with it. It would however be difficult for the physician to comply with the patient's wishes if he believed that the risk-benefit ratio was unreasonable. All the more so because patients frequently tend to underestimate the risks in the light of their own representation of the advantages they expect to obtain. If a patient is unwilling to accept a physician's negative response, second opinions or counselling could possibly be arranged.

b. Informing the patient and consent

Patients must be informed with precision of difficulties, risks, and probable results. In particular, they must have the most accurate notion of the risks caused by the procedure, such as failure or rejection, and of the dramatic situation in which they would then find themselves, even compared to their present condition. Patients must also be seriously informed of the possibility of delayed rejection of the graft, despite apparent immediate success.

Generally, all precautions need to be taken regarding the free and informed character of consent. Consent must be validated, as also the decision on surgery, by an independent authority.

Cases might arise where patients are not competent to give consent. They might be incapable for instance of understanding information, of weighing their decision, of fully integrating the risks. In the present state of affairs, and in view of the uncertainties attached to the procedure, it is only right that individuals of that description should be considered as unsuitable for this kind of graft.

It must however be emphasised that regardless of the case for which a procedure of this nature is contemplated, the very nature of consent obtained from patients is questionable. The major problem raised by partial or total facial allotransplantation, in the current status of this technique, is the paucity of available

information as to the chances of success of the procedure and its concrete results. This is in fact surgical experimentation and research, which must not be confused with routine surgical procedure. This is why, as a matter of principle, one can consider that, at this point and for this type of procedure, informed consent simply cannot be given. In fact, the information needed so that informed consent can become a reality is just not available.

A further point to remember is that such a procedure would be hailed as a spectacular achievement. It is to be feared that such a prospect might induce surgeons to “encourage” their patient’s consent, who would anyway be in a position of vulnerability. Perhaps as a general principle one should consider a stipulation that the person who secures consent would not be the operating surgeon.

In the present state of affairs, the call for facial allotransplantation, particularly full transplantation, does not seem to be an unfulfilled demand from patients. It would appear to more closely correspond to a demand from surgeons wishing to perfect this technique*.

3. Ethical problems connected to consequences for the patient

Some obvious ethical problems have already been noted.

a. The problem of immunosuppressive therapy

Strictly speaking, grafting composite tissues onto a face aims first of all to improve the quality of life of the person concerned, and not to treat a serious or lethal condition. Furthermore, following a partial or total facial graft, the patient would migrate from a situation of handicap (with all the painful psychological and social consequences mentioned previously) to a situation of morbidity. Such a patient would be under a life-long sentence of immunosuppressive therapy, the secondary effects of which are frequently serious. Once the principal vital functions have been restored (breathing, feeding, mastication) the facially injured do not suffer intolerable physical pain. Nor are they sick. However, that is what would happen to patients following this kind of operation and the condition would be all the more difficult to bear if surgery was undertaken early in life. Furthermore, it should not be forgotten that there are an estimated 15-18% of people who, after a transplant operation, are unable to observe immunosuppressive treatment (particularly the young and patients from deprived social categories).

To improve a patient’s quality of life, one would start by deteriorating it. Is it acceptable to knowingly offer therapy that would relieve a handicap but make sick a person previously free of disease? Medical ethics is partially based on the principle of “non malevolence” which is therefore eroded in such a case. It is up to the patient to weigh present and future sufferings against each other. But it is clear that patients contemplating this kind of surgery must be very exactly informed of the long-term consequences of their decision.

It is true that research developments on tolerance to grafts may lead us to believe that serious progress is likely as regards treatment. It is therefore possible in future, if effective immunosuppressive therapy without side effects becomes a

* One sign was the enticing presentation that the internet site Doctissimo made of the very reserved recently published report of the Royal College of Surgeons, regarding the possibility of such transplants. For this reason, the greatest caution should be observed in scrutinising patient consent, and this supposing that this type of intervention is possible without major risks and that informed consent is accessible.

working proposition, that this kind of ethical dilemma will no longer be an issue. But this is still a distant possibility which in any event should not lead to underestimating the risk of delayed rejection.

b. Disappointment in case of failure or very limited success with a graft

Although it is conceivable that a total or partial graft could produce acceptable results in this kind of case, there would still be very little likelihood for a grafted face to regain complete mobility of expression. A grafted face will retain some of the characteristics of a mask. Of course, if the graft were partial (the lower part of the face including the jaw, or the nose, or the scalp) the problem would be minimised: progressive innervation might be reconstituted and expressive inertia would in any case only affect a portion of the countenance.

Furthermore, even supposing that suture of the facial nerve trunk or of its main branches was successful, there is still the unanswered question of how cerebral circuits would be able to integrate this new neurological situation to enable a cerebral representation of the grafted organ.

Above all, we must not forget that if the facial transplantation were total, the consequences would be dire for a patient in the event of failure. If the procedure was a failure for technical reasons, or if unfortunately the patient was unable to accept the graft for physical or psychological reasons, the forced removal of the transplanted face would be dramatic. This is because, before proceeding with the allograft, all previous autotransplantation grafts would have to be detached. If the new graft failed and it became necessary to take the decision of removing it, then one would have to resign oneself to ending up with a final result much worse than the patient's condition before surgical intervention. It would be necessary to go back to the starting point for the whole process of reconstruction with conventional methods, if indeed this was still feasible. Only rarely are surgical situations as dramatically irreversible. If only a part of the face has been grafted, the difficulty persists, but to a lesser degree. Nevertheless, there again, should such a high-risk intervention be performed when there is no truly acceptable possibility of reversal? Without repeating previously expressed doubts regarding the validity of informed consent in such circumstances, a "Ulysses' choice" of this nature needs to be explicitly articulated by the practitioner and fully understood by the patient.

c. Problems of identity

It is only to be expected that following such an operation, a patient would experience considerable psychological problems.

Some of these problems arise for anyone receiving a graft. They are connected to anxiety about failure of the graft, fear that there will be rejection, worries about the secondary effects of therapy. Patients sometimes feel that they have some kind of responsibility for the success or failure of the graft. Difficulties also arise because of psychological unease connected to possible feelings of gratitude, morbid curiosity, or embarrassment, as regards the deceased donor.

However, other consequences are specifically connected to the fact that the graft concerns the face, be it a partial or a total graft. Supposing the operation is a success, the mutilated individuals will no longer have the face they had before, they will have a new face, which they will have to get used to, and which they might experience as being someone else's face. They may accept the new face, but they may also reject it.

One can hardly avoid mentioning here the famous case of the first allograft of the hand performed by professor Dubernard. The patient was ill prepared psychologically, did not comply with immunosuppressive therapy, and finally, as we know, got to the point where he could no longer stand the sight of his hand. A face grafted patient might well – we cannot disregard the possibility – come to consider that his own face was in fact someone else's face. A situation such as this would hardly be an improvement on the previous one. One can imagine the distress of a person who no longer feels he has a face, neither for himself nor for others, and cannot identify himself in his own mind. This would not be psychological rejection of a part of oneself, but of the whole of oneself. If the transplant only concerned part of the face, difficulties would be identical, although attenuated.

d. Difficulties for relatives and friends and the inevitably spectacular character of the procedure

One must again take into consideration the fact that psychological difficulties in recognising and accepting the patient's new face may also apply to relatives and friends. They may have difficulty in accepting the patient's new appearance, and such difficulties will certainly affect the patient also. The patient's face will bear obvious traces of the intervention. Will it be easy for patients to explain to strangers that they have had a full or partial facial graft? And even if totally hypothetical surgical progress managed to eliminate any trace of surgery, would patients be able to conceal that there has been an operation?

Finally, the risk of patients or their friends and family being harassed by sensation-seeking media, at least when the first of such interventions are performed, must not be neglected (see CCNE's Opinion n° 45). Such a situation would be traumatic for the patient. It could also contribute to spreading the notion that clearly life with a damaged face is not worth living and that everything and anything must be attempted to reverse this situation. As a consequence, the ill-informed public might entertain partly outlandish ideas about the possibility of changing one's face, even for those who are simply dissatisfied with their physical appearance, or would like to appear younger.

4. Ethical problems connected to the practical implementation of these interventions

Practical problems with this kind of intervention are connected to obtaining grafts, to their selection, and to the development of operating procedures.

a. Obtaining grafts

A graft is only possible if there is a donor. As public opinion is presently minded on these matters, it seems quite inconceivable to ask a grieving family to authorise the harvesting of the whole or part of the face of their deceased relative. Families, and society as a whole, are attached to the notion of respect for the body, and in particular the face, of the dead. The post-mortem portrait, painted or photographed, that family and friends see and remember, is one of the major markers of our humanity. Incineration thereafter does not change the nature of this attachment. As it is already difficult enough to obtain agreement for donation of an internal organ, one would surmise that a similar request for the face would meet with almost universal refusal. Refusals regarding the cornea are a convincing precedent.

The only possibility left to obtain grafts would be to harvest them from people who had explicitly stated that they authorised the procedure, or from the dead without any family. It is however quite out of the question, for obvious ethical reasons, to consider that people in these circumstances are potential donors and a guaranteed source of supply.

Nevertheless, there are solutions to the problem of scarcity of donations.

To begin with, sensitising public opinion to the unenviable situation of the disfigured, and the practice of this type of operation could perhaps reduce feelings of astonishment, or even horror, experienced by families approached for this purpose, and could encourage some people to authorise the procedure on their own bodies after their death. An amendment to be included in the next bioethics law classifying the harvesting of composite tissues in the category of organ donation could contribute to preparing public opinion and increased receptivity for such requests. However, care should be taken that authorisation of CTA harvesting does not bring about a reduction in organ donation. Although at the present time, make-up techniques are available to reconstitute the faces of cadavers from which samples have been harvested, and give the illusion of an intact body - this being mandatory under existing regulations- families are still fearful of visible marks.

There is another, and infinitely more difficult problem to solve. Clearly, a face cannot be grafted, partially or in its entirety, without taking into consideration the appearance of that face and the type of morphology it presents. The reconstructive surgeon will therefore seek to secure a graft which is as close as possible to the type of face of the patient. Again, it is not some anonymous face which will be transplanted, it is a well-identified face. When you are transplanting a kidney or a heart, any kidney and any heart will do. There is no need to choose, apart from the criterion of tissular compatibility. But the face is different. However, apart from the difficulty of finding a donor, with a facial graft there is the added problem of matching donor and recipient, in particular as regards the colour of skin. In this particular case, the difficulties are well nigh unimaginable. It is hard to picture a surgeon in an emergency situation, picking through photographs of potential donors to find the face which best matches the face of his patient. Would not the conditions in which transplant operations take place suffice to exclude this kind of situation, particularly so if the object of the operation is not to save a life, but to alleviate a handicap? In a situation which would be halfway between casting for a show and tragedy, it is difficult to envision the rules or ethical criteria that could be elaborated to deal with it.

b. The limits of animal experimentation. Implementation of this type of intervention and other solutions

Finally, one cannot ignore a major difficulty. The full or partial transplant of a face cannot benefit from the lessons learned by animal experimentation. The structure of a human face is in fact very different from the muzzle of an animal. The question of mobility of expression, which is so decisive for human beings, has no animal counterpart. Facial grafts therefore will in most cases be empirical, without true experimentation beforehand. In the present state of the art, for lack of experimentation, it is impossible to predict the long-term survival of these grafts. In case of failure, the patient would suffer grim consequences. Furthermore, these frequently spectacular interventions attract media attention that tends to present them, with sometimes the complicity of surgeons, as a major exploit. Resulting

pressures could compromise the aloofness and gravity that are required to take this type of surgical decision.

Lastly, it should be heavily underlined that there are numerous other possibilities for reconstructive surgery of the face besides composite tissue allotransplantation. The latter are still in the category of largely uncertain ventures whereas many other validated procedures used by highly specialised surgical units who do not use CTA, already produce highly commendable results.

Conclusion

The expression “facial graft” should be discouraged. It is never a face that is grafted, but composite tissue. The fantasies surrounding this kind of intervention, which is no more than an allograft of composite tissue for the purpose of repairing a face that has been deformed or destroyed, must also be resisted. The very idea of a person ‘wearing’ someone else’s face is pure imaginative fiction. Other composite tissue grafts generally seek to regain a function, whereas in this case the purpose is to reconstitute an “acceptable” presentation. What such a presentation signifies when it is borrowed is still an unanswered question. A tissue is not a face, but the object is to provide morphology that will again be akin to a human face. That is why there are ambiguities for both donor and recipient. Facial transplantations are not the same as organ transplantation and are far indeed from the graft of limbs. That is why they should not be practised before further and complementary research has made it possible to evaluate with precision the risks inherent to this type of intervention, and to validate results.

In an emergency, the progress of reconstructive surgery using autotransplantation to a considerable extent, and according to well-validated procedures, requires that highly specialised units have early access to their patient. Transplants from the body of another subject, however, can never be carried out in an emergency environment for obvious reasons of availability and choice.

In a non-emergency situation, Composite Tissue Allotransplantation requires the removal of whatever autografts and other repairs already exist. In case of failure, the situation is worse than the point of departure.

Lifelong immunosuppressive therapy means that a person who was previously in a situation of major handicap enters into a life-threatening condition. In circumstances, however, where there is a consensus that all autograft and prosthetic possibilities have been explored in vain, where demand is very insistent, and the possibility of such a graft becomes available, the very notion of informed consent is an illusion. The surgeon cannot make any promises regarding the results of his restorative efforts, which are always dubious, and in this particular case, reversibility is not as it would be with a hand graft. Failure may aggravate the existing situation. The difficulty for patients to imagine – despite possible computer assistance – what their face will eventually look like is related to the extreme complexity of what the face represents. Lifelong immunosuppressive therapy, which is always perfectly acceptable at the outset, in the long term may become an intolerable imposition, on the occasion for instance of intercurrent disease or with ageing. What then of the price to be paid, i.e. the rapid and inescapable destruction of one’s face?

Authentic consent, therefore, will never exist. Even mediation by psychologists or psychiatrists who are fully aware of the complexity of what is at stake, is utopian.

The question of donors is probably the principal obstacle. All human societies have invested in the face such a wealth of symbolic value, that it is difficult to imagine that there would be any frequency of explicit donation. Implicit donation, as for organ donation, is just as much of an illusion. Even the notion of early cremation to allow for such a donation does not annihilate the need for respecting that body immediately after death. Carving up a body is already seen as a form of violence which is only acceptable because it can save other lives. To remove a face only to give hope to one whose face has been destroyed is unlikely to be accepted as life saving.

Finally, this kind of intervention will be spectacular and will focus excessively the attention of the media in spite of any precautions that could be taken. Sensationalism will overshadow surgical considerations.

In conclusion, a full facial CTA does not make much sense for the time being. In point of fact, the question does not arise in medical or technical terms. The possibility of partial CTA for a reconstruction of the mouth-nose triangle to regain some morphological identity for the face is still in the realm of research and high-risk experimentation. It cannot be presented as an early, accessible and ideal solution for the distressing problem of facial disfigurement. Should such procedures be considered, then they should be contained within the bounds of precise multi-disciplinary and multi-centric protocols, submitted for approval to the *Etablissement Français des Greffes* (French Transplant Institution) or some similar establishment with identical responsibilities.

February 6th, 2004