Current concepts

Psychological management, prevention and treatment of phantom pain after amputations for tumours

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Summary. *Amputation for tumours is rarely carried out nowadays and has few specific technical features, apart from the rare cases where ingenuity is required to gain a few centimetres in length of a stump. As far as possible, the decision for amputation should not be imposed; it is better that the patient himself should take the initiative. The prosthesis and its constraints should be described honestly to avoid subsequent disappointment. Prevention of a painful phantom limb must always be undertaken, and based on certain operative and perioperative precautions. The most important factors are treatment by psychotropic agents and the quality of the human relationships between patient and surgeon.*

Résumé. *Les amputations pour tumeurs sont devenues rares et ne comportent guère de particularités techniques, en dehors de quelques cas rares où il faut faire preuve d'imagination pour gagner quelques centimètres. C'est ce qui se passe autour de l'os (infection, séquelles d'irradiation, gros envahissement des parties molles) qui fait préférer l'amputation aux procédés de résection-reconstruction. La prévention du membre fantôme douloureux doit être systématique. Elle repose sur quelques précautions opératoires et peri-opératoires. Les éléments les plus importants en sont: le traitement par les psychotropes et la qualité des relations humaines entre le patient et les thérapeutes. Il faut tout faire pour ne pas imposer la décision d'amputation: il faut faire en sorte que ce soit le patient lui-même qui en prenne l'initiative. L'appareillage et ses servitudes doivent être présentés avec une grande honnêteté pour éviter les désenchantements ultérieurs.*

Introduction

Only 25 years ago, sacrifice of a limb for a primary malignant tumour was considered obligatory in almost every case. Nowadays, preservation of the limb is possible in most cases. Often the surgeon does not know how to discuss this problem with the patient, and avoids doing so.

In what psychological setting should we arrange our discussion with the patient to whom amputation is recommended? How can a painful phantom limb be prevented or treated? What are the particular techniques of amputation for tumours? These are the questions for which we will try to find answers, based on daily experience of these problems over the last 25 years during which time we have treated more than 2000 bone and soft tissue tumours, including about 300 amputations.

Psychological problems

The psychological setting in which the loss of limb occurs is important in its acceptance and the prevention of a painful phantom limb [14].

(1) When and how should the patient be informed of the need for amputation? [1]. Twenty-five years ago it was quite usual to decide at the last moment, often the previous evening, sometimes even after the patient had been given a hypnotic. The idea was to shorten as much as possible the distressing period between the decision and performance of the operation. Actually, there is probably nothing worse than this manner of proceeding. An interval of several days, or even weeks if circumstances allow, as when preliminary chemotherapy is given, is essential. The patient should have time to review the psychological problem and to find within himself the resources for a voluntary consent to the operation. It is best to avoid im-

perative phrases, such as 'you must have an amputation'. On the contrary, the patient should be told with as much humanity, patience and gentleness as possible 'your disease is dangerous'. It is unnecessary to use the word cancer since most people do not need to have this spelled out; if the word is spoken by the patient it should be used without embarrassment [4, 10, 13]. The doctor should say 'if we don't do things properly, your life may be in danger. To give you the best chance of survival we have to consider the sacrifice of your leg. This is such a serious decision that only you yourself can take it. It is so important that we cannot make a decision lightly and in five minutes. Think it over and we will have another talk tomorrow'.

The matter should be managed so that the patient does not feel that he is being forced to have an amputation; rather, he should feel that it is he himself who has made the decision. This dialogue is only an illustrative condensation. Sometimes, the first words will only be a suggestion of the possibility of amputation and will serve simply to alert the patient. It is during the following days that the procedure can be revealed more clearly.

It is essential that the patient should feel that our attention is totally available to him. He should be offered the possibility of questioning us and of further discussion as much as he wishes: 'this is my office address and you can reach me by telephone at the following times'.

During these conversations one should sit [2] at the patient's bedside to show him that we are prepared to give him our time which avoids the unpleasant impression of the 'hurried standing doctor' and the 'impotent supine patient'; sitting down places the doctor at the patient's level.

(2) What different reactions may the patient exhibit? The way in which the patient reacts to the news of amputation varies. There are three possibilities:

- *Ready acceptance.* Some patients seem to have no difficulty in accepting the loss of their limb. Some are astonishingly serene, giving the impression of great courage which is sometimes indicative of a strong personality able to tolerate the course of events, but this is often suspect. Too facile an acceptance is often at the cost of a severe and persistent state of postoperative depression which may be irremediable and permanent.

- *Revulsion and temporary refusal,* which is more usual and more normal. This first violent reaction must be respected, and the patient told that the plan is only a proposal, that it is he who must decide, that he has the complete right to refuse, that no procedure will be conducted without his consent, and that there will be a further discussion in a few days. He must consider two hypotheses: (a) not to undergo amputation with an increased risk of a poor outlook, or else (b) to accept the loss of a limb to give a better chance of survival. In at least 95% of cases, after a few days, the reply is: 'Oh well doctor, since it has to be done... go ahead'.

- *Firm and definitive refusal* is exceptional. We have only seen it 3 or 4 times in 25 years and these patients died. This corresponds either to personalities that are too uneducated and obstinate, or to patients who are perfectly aware, who have often already undergone much treatment for their disease, and who decide that the time has now come to fight no longer.

- *Age is not unimportant.* The difficulties in accepting the sacrifice are undeniably proportional to age; matters often are easier with children. The same applies to the manner in which the patient will experience his future state as an amputee.

(3) What should the patient be told about his prosthesis and his future mode of life as an amputee? The first objective is not to deceive him. It is unforgivable to make anyone believe that an artificial limb is almost as good as a real one and that he will walk again just as before. He should be told exactly what life will be like with the prosthesis and that it will certainly be very different, but nevertheless possible. He should be informed of the limitations and disadvantages of a prosthesis, and also of the phantom limb and its prevention. It is a very useful preoperative measure, when feasible, to introduce the patient to other amputees. Two courses are possible.

- To organise a half-day visit to a limb-fitting centre where the patient will be able to talk things over with the doctors and remedial therapists. He will see patients during their limb-fitting, ask questions, and realise that he is not alone.

- To make him acquainted with an ex-amputee. This is an excellent course. He should have available a network of former amputees, if possible of all types, so that he may find someone comparable as regards both the level of amputation and his social conditions. Patients who have already had an amputation are invaluable. They are happy to do this service, and are ready to take one or more half-days from their work to visit the candidate for amputation. Quite often, bonds are formed between them which mean that they remain in touch after the surgical procedure. This solidarity between patients is one of the greatest satisfactions we have encountered in a career during which, unfortunately, it has often been necessary to undertake surgical procedures without much glory or gratification, and quite often devoid of any technical interest.

The painful phantom limb

It is well known and indeed quite normal for an amputee to retain the feeling of the presence of the amputated limb. Though this sensation is not painful the patient should be informed that this feeling of a simple phantom limb is normal and he should be encouraged to accept the phenomenon. What is more distressing is the presence of a painful phantom limb [6, 9].

The intensity of this pain varies in different patients and over time, and is largely influenced by the

psychological background. Severely painful syndromes, leading to drug abuse, severe depression, or even suicide, have fortunately virtually disappeared now that we know how to treat, and especially to prevent, the painful phantom limb. Measures to be considered are technical peroperative precautions, and the psychological context of the amputation [14]. An amputation that is poorly advised, poorly accepted and poorly experienced is far more liable to frank and persistent painful syndromes.

Precautions during the operation

The sensations transmitted along the peripheral nerves to the cerebral centres are successive in nature, and a subsequent sensation erases a preceding one [9]. When the sciatic or femoral nerve is divided, there are reasons for thinking that the last sensation transmitted to the brain will be an unpleasant one, and risks becoming established because of lack of any subsequent stimuli. The nerve trunks must be handled gently, sectioned high up to avoid a neuroma at the pressure area on the end of the stump, and injected with Novocaine a few minutes before division, even if this is done under general anaesthesia. If the arteriole accompanying the nerve bleeds rather freely, diathermy coagulation is particularly undesirable because of the cerebral impression this leaves, and it is better to do nothing at all and wait for haemostasis to occur spontaneously. The nerve stump should not be embedded in a muscle belly as has been suggested, since muscular contractions may irritate the nerve.

Perioperative care

It is unnecessary here to discuss the problems of ordinary postoperative analgesics since their prescription does not differ from that in any surgical procedure. There is no objection to using morphine derivatives, but they should be given on demand, as for any other operative procedure, since the need depends on the individual's tolerance for pain. Is there a place for postoperative local and regional anaesthesia? This is certainly an excellent help in surmounting the difficulties of the first few days. Spinal anaesthesia or injection of the sciatic or femoral nerve trunk can be used, leaving a fine catheter in place for a few days to allow repeated injections [5, 8].

The essential factor in prevention of painful phantom limb is treatment with psychotropic agents. We discovered empirically during the last 25 years that these agents were effective in combating the painful phantom limb [12]. We have gradually developed a therapeutic programme that we now use routinely. These drugs act in two ways, they have a true analgesic action and they modify the painful life experience by their anxiolytic, disconnecting and/or euphoric properties.

It seems best to begin treatment 2 to 8 days before operation, to continue for several weeks, to stop only

Table 1.

	Morning	Afternoon	Evening
Diazepam (Valium)	5–10 mg	5–10 mg	10–20 mg
Imipramine (Tofranil)	10–25 mg	0–25 mg	nil
Amitriptyline (Larxyl)	nil	5–20 mg	20–30 mg

Trade names: diazepam=Valium or Valrelease (Roche); imipramine=Tofranil (Ciba-Geigy); amitriptyline=Laroxyl or Endep or Loxaryl (Roche); clomipramine=Anafranil (Ciba-Geigy); carbamazepine=Tegretol (Ciba-Geigy). Note: No benefits have been received or will be received from a commercial party related to the subject of this article, including Ciba-Geigy and Roche Corporations

by progressive reduction of dosage. The dose which is increased as long as the pain is poorly controlled and cautiously reduced when it has been effective for some time or when it produces excessive drowsiness.

Our usual dosage schedule is shown in Table 1. We begin with small doses and often increase them as the days pass. Imipramine may be replaced by clomipramine. These analeptics should be given morning and midday. Amitriptyline, which is more neuroleptic and hypnotic, should be given in the second half of the day. There is no objection to adding an ordinary hypnotic or a tablet of carbamazepine. Using this scheme, pain has become inconstant, often transient and always less severe. Some patients, however, remain dependent on minor maintenance treatment, more or less for life, although this is quite rare. It should be remembered that it is the painful element of the phantom limb that is being dealt with, and that there is no point in trying to abolish the phantom itself.

Technical aspects of amputations for tumours

Amputations for tumours are often regarded as commonplace, and conform to the instructions in textbooks of surgical technique [13]. Only hindquarter amputation, which removes the limb and half the pelvis, can be a major undertaking, often arduous, long and difficult [4, 18]. The functional use of a prosthesis is better when there is a long stump [9]. To save these few centimetres, and to be as conservative as possible, there are two surgical variations which follow the principles of Enneking's resection:

● *For tumours of the posterior part of the upper end of the thigh invading the lower buttock.* After disarticulation of the hip, the stump is closed by a musculocutaneous flap of the gluteus maximus reflected forward. In some cases these structures have been invaded by the tumour and cannot be preserved, so that hindquarter amputation may seem unavoidable. To preserve the pelvis, the hip can, however, be disarticulated using a reversed technique which sacrifices the buttock and obtains closure with an anteromedial thigh flap, centred on the great vessels at the base of the limb, and reflected backwards.

● *For tumours invading the lower part of the anterior thigh compartment.* Normally, a thigh amputation is closed by joining a short posterior flap to a long anterior flap, covering the end of the femur with the quadriceps muscle. For this type of tumour, it is necessary to consider amputation at the upper end of the thigh; by reversing the flaps to give a short anterior and long posterior it may be possible to save a few centimetres and to amputate through the middle third of the thigh.

● An almost infinite variety of other applications of this concept can be imagined. After all, the technical textbooks exist to teach us the principles and not to provide methods to be followed blindly. They should be read and given careful consideration.

How far from the tumour should amputation be performed? It used to be taught that amputation must be made through the bone proximal to the disease, through the femur for a sarcoma of the tibia, through the hip-joint for a sarcoma of the lower femur. These concepts have long been abandoned; it suffices to amputate a few centimetres above the upper pole of the tumour, a limit that can be precisely established by means of MRI. If there is a skip metastasis several centimetres above the primary lesion, the upper pole of this lesion is decisive. The level of this safety margin is determined by:

● the histological severity: a margin of 2 cm is adequate for a tumour of low-grade malignancy, whereas for a high grade sarcoma a healthy margin of 4–6 cm is wiser.

● the sharpness of definition the tumour: if its boundaries are vague or if they differ in different types of imaging, a wider margin is indicated.

Conclusion

One of the most important aspects of amputation for tumours must be the psychological management. The surgeon can no longer be only a technician, but must also establish a confident and sincere relationship with the future amputee. The dialogue with the practitioner helps a good acceptance of the amputation, and constitutes the basis of an effective prevention of painful phantom limb. The patient must never feel he

is being forced to have an amputation, he should understand the importance of treatment being related to the best chance of survival. He must also be informed many days, or if possibly many weeks, before surgery with clear information about his future life and the limits of the prosthesis. The best way will be a visit to a former amputee.

This psychological management will be associated with treatment by psychotropic agents to prevention the development of a painful phantom limb.

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