Lower limb amputation: Towards a successful geriatric rehabilitation.

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Despite the advances in surgical treatment of amputation, particularly in reconstruction, it is a sad fact that the number of amputations performed is increasing. This is due to: an increase in the elderly population, an increase in the number of trauma and accidents, an unhealthy diet, smoking, vascular disease and diabetes. The main aim of an amputation procedure is to save the patients life while conserving as much limb as possible so as to make it easier for the prosthetic fitting.

Table 1: Local statistics for the below and above knee amputations in Malta.

	MALES	FEMALES	TOTAL PER YEAR
YEAR			
1995	N/A	N/A	112
1996	63	56	119
1997	71	65	136
1998	71	54	125
1999	73	62	135
2000 (up to Sept)	N/A	N/A	90
	278	237	717

N/A – data was not available.

The main causes of amputation are peripheral vascular disease (PVD), diabetes mellitus, tumors, trauma, extensive infections and congenital.

Occlusive arterial disease is the commonest cause of death in the Western World and by far the most common cause of lower limb amputation. It accounts for more than 2/3 of the amputation in people in the older age groups. It is most frequently caused by atherosclerosis and smoking (Levy, Friedman & Osbourne, 1992). Other factors include vascular trauma, peripheral aneurysm, diabetes, obesity, and diet. This will cause severe arterial insufficiency with necrosis of all or part of an extremity, intractable and severe pain that disables the patient, and infection that will spread or not respond to therapy. Amputation is performed when limb salvage by reconstruction has failed or is not feasible. Here patients require special consideration and require a more intensive pre-operative preparation.

Diabetes Mellitus is a systemic disorder in which the level of blood glucose is persistently raised above the normal range. It is an etiologic factor in ¼ of patients, causing infection that

leads to gangrene. Wound healing is often very poor and even a minor trauma can be a major problem. A high glucose level in the wound encourages bacterial growth resulting in infection, which may also extend to the bone. This will lead to gangrene of the foot and therefore will lead to amputation. In order to heal, a more proximal level of amputation must be chosen.

Tumors - The main reason for amputation in tumors is to cure and to remove pain (palliative treatment).

Trauma - Most amputations in the western countries are due to motor vehicles and industrial accidents, but some are secondary to severe trauma such as burns (Kay and Newman, 1975). Amputation may be necessary due to extensive tissue damage, vascular damage, burns, bony non-union, blood vessels rupture, stab and gunshot wounds, cold trauma (frostbite) and severe nerves injuries.

Extensive infections - Penetration wounds such as gunshot wounds, sometimes can also lead to an amputation to save one's life.

Congenital deficiency/juvenile amputation - This may either be congenital or acquired as a result of a trauma, such as by accidents, gunshots, explosive and burns, tumors, infections and diseases such as tubercolosis.

Levels of Amputations

Amputation is performed at the most distal point that will heal successfully. The site of amputation is determined by the circulation in the part, and by, the functional usefulness. The higher the level of amputation, the greater the functional loss of the part and the more the amputee will depend on the prosthesis. One should also consider the length of the stump, which should be sufficient for function of a prosthesis and the cosmetic effect of the prosthesis. An above-knee amputee requires about twice as much energy to ambulate as a person who has a below-knee amputation. One should make an effort to preserve the knee joint. The patients' general condition and particularly, the feasibility of rehabilitation are also considered prior to the operation.

Psychological reactions

The loss of a limb is a stressful event in anyone's life. The way patients react is very individualised and depends on many factors including the previous medical history, the cause of amputation, the previous experience to loss, coping strategies, role changes, family reactions and attitudes, social support, culture issues, and the expectations on rehabilitation. Therefore, psychological changes following amputation are a combination of many factors. Denial, sadness, anxiety, body image changes, uncertainty and sexual difficulties are some possible reactions following an amputation.

Clients will pass from a period of bereavement (which takes place over a period of time). Grief and mourning for the loss of a limb is also a common reaction exhibited by a patient whilst trying to cope with his new body image and self-concept.

Phantom limb pain/ sensation

In a study of 6300 amputees, more then 90 per cent experienced phantom limb pain and sensation, regardless of the time elapsed from since the amputation (Sherman and Tippens, 1982). Phantom limb pain is defined as pain referred to a surgically removed limb or portion thereof (Merskey, 1986). Phantom limb sensation is defined as non-painful sensations referred to a missing limb/part of the limb (e.g. difficulty to locate cutaneous sensation of numbness, heat, cold, tingling and itching; complex sensations including feelings of posture, length and volume; and movement which can be willed, associated or spontaneous)

A number of psychological approaches, such as hypnotherapy and psychotherapy have been used to decrease these symptoms (Parkers, 1975). Drugs such as carbamazepine, chlopromazine and propranolol are also used (Oille, 1970). In severe cases surgical intervention, such as nerve blocks, neurectomy and thalamic surgery can be done. In recent years, the use of transcutaneous electrical nerve stimulation to relief this

pain/sensation has shown encouraging results (Katz, Melzack, 1991). The fact that there are so many treatments suggests that none is really effective.

Rehabilitation

The W.H.O. (1972) defines rehabilitation as the combined and co-ordinated use of medical, social, educational and vocational measures for training and retraining the individual to the highest levels of functional ability (cited in Hagedorn, 1992). Rehabilitation is concerned with the restoration to the optimal level of ability within the need and desire of the individual by relearning skills to function as competently as possible. Rehabilitation following an amputation is a total program that involves a variety of problems such as mobility, transfers, activities of daily living as well as vocational interest. Support must be given to both the patient and his family/relatives before, during and after the operation procedure.

In order to be a successful rehabilitation it needs to be carried out within a multidisciplinary team. The core team in rehabilitation of an amputee patient includes the physician/ surgeon, a physiotherapist, an occupational therapist, a prosthetist, a medical social worker and a vocational counsellor. Other health professionals who contribute to the team are the nurse, dietician, psychologist and possibly the administrative co-ordinator (O'Sullivan and Schmitz, 1994).

Successful geriatric rehabilitation can be obtained given that there is collaboration between different members of the multidisciplinary team and adequate environmental conditions for the patient. The team will assess, treat and evaluate each patient in a holistic model approach. The team should work together in harmony, where realistic and common goals/objectives are set. The client and his/her relatives/family should be actively involved in the treatment process and decision-making.

Locally, there is a need to have updated statistics for further research. Research is needed, to have a better local perspective and an in-depth knowledge on this field. There is also a need for setting up of an amputee unit in the new hospital. This will ensure the optimal quality of care prior, during

and after the operation, to allow for further specialisation in such a field while encouraging students and researchers to carry out in-depth research. There is also the need to set up a voluntary association/support group. I truly believe that an interdisciplinary team approach towards these patients should be adopted, where the clients and his/her family or relatives are actively involved in the rehabilitation.

References

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