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The Amputee Athlete

by Richard Riley, C.P.

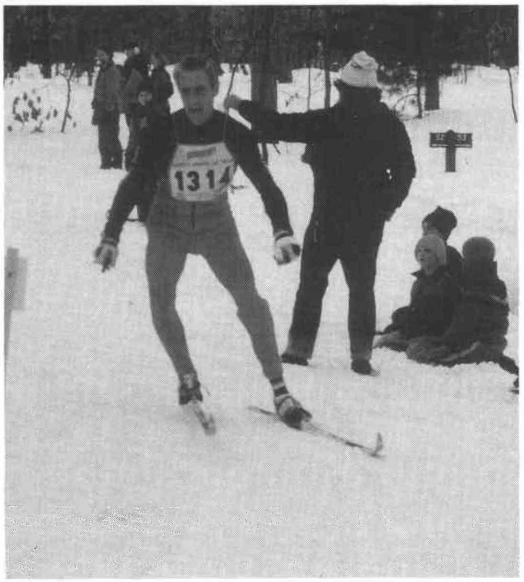

Figure 1. Below-knee amputee, George Lombard, member of the Fisher-Saloman Marathon Team and the U.S. Disabled Ski Team.

An increasing number of amputees in the United States are moving beyond mere ambulation into active sports and recreation activities. Estimates of the number of amputees actively involved range from 15,000 to 20,000, with over 5,000 participating in organized competitive sports.[1]

Ten years ago, the athletic amputee was a unique phenomenon in our practice. Today few practitioners cannot count two or three among their clientele. These amputees are at the cutting edge of our field because they push us as professionals to expand our perceptions of what is possible. They also provide the positive role models that we hold out to the rest of our clients as an example of what can be done.

The able-bodied sports world has taken some giant leaps of perception regarding the amputee athlete. No longer is it just "inspirational" to have a disabled person competing in sports. Today there are amputees that compete in world class events alongside the able-bodied. The skiing world has demonstrated this by naming below-knee amputee George Lombard to the Fischer-Saloman Marathon cross country ski team and awarding above-knee amputee Diana Golden with the U.S. Ski Writers Award for Outstanding Alpine Competitor.

Not only are there more elite amputee athletes today, there is a much larger body of recreationally oriented amputees. The days are gone when the prosthetist and rehabilitation team could be satisfied with being able to get the amputee to just walk. Expectations of our clients have changed. Not only the younger amputee, but also the active geriatric expects to be able to ride a bicycle, play golf, tennis, or jog around the block.[2] Our challenge is to meet these expectations.

Psychology of the Amputee Athlete

What causes one amputee to become an elite cross country skier (one of the most demanding physical sports in the world) and another with the same level of disability to be unable to even return to gainful employment? Part of the answer lies in the individual's ability to handle the stress and trauma of amputation. These are factors that we have little control over. The other part of the answer lies with environmental issues and can be addressed.

Most amputee athletes are highly motivated individuals with a strong desire to overcompensate for their disability. A percentage of these

Skin Care Products
Spenco Medical Corporation Box 8113 Waco, Texas 76710 1-800-433-3334 (For 2nd Skin™ and Spenco® Skin Care Pad)
Johnson & Johnson Products Inc. New Brunswick, New Jersey 08903 (for Bioclusive®)

Table I.

people will rehabilitate themselves with practically no help at all and go on to accomplish great things in their personal lives as well as in sports. Others need the influence of role models to show them that their limitations are what they place upon themselves. One of the most positive experiences for any new amputee is when they meet another amputee with a positive attitude.[3] This positive motivation is best facilitated by a support structure of family, friends, and the rehabilitation team. If any one of these aspects is continually placing limits on the amputee, eventually the amputee will accept these limitations. There are physical limitations for the amputee, but these should be discovered not imposed. There are ways around most physical limitations by keeping an open mind and being willing to innovate.

Pain is an aspect of amputation that in many cases is initially the greatest barrier to overcome. All athletes know pain through training and the physical exertion of competition. People who are athletic prior to becoming an amputee will generally be able to deal with pain more easily due to their previous development of strategies to perform while enduring levels of pain. The successful amputee will develop ways of minimizing discomfort, either through increasing the conscious tolerance for pain or seeking a lifestyle that reduces trauma to the residual limb.

The amputee athlete not only has the pain of general physical exertion to deal with, but also the added trauma of torques and stresses far beyond normal to the skin and bone structure of the residual limb. Most of these athletes have developed very high pain tolerances and their body readily reacts to pain stimuli by releasing endorphines[4] (the body's natural pain medication) into the body. These factors enable the amputee athlete to achieve great physical accomplishments. It also sets up potential for serious damage to the residual limb tissue because of overactivity. Pain is the body's message to the brain that something is wrong and many amputees have developed ways to short-circuit this signal. This is a fact we must all be aware of in caring for and guiding the amputee athlete.

Prosthetic Care

For the prosthetic professional, the active amputee can be either a great source of pride and stimulation or a perpetual problem fraught with frustration. Nevertheless, this group of our clientele will continue to occupy a greater share of our patient load and we must develop strategies to successfully accommodate their needs.

As important to the success of the athletic amputee as the prosthesis is his knowledge of how it works. Of equal importance are the limitations of the prosthesis and problem solving strategies for residual limb breakdown. The time spent in educating the amputee about his prosthesis and ways to deal with skin problems is always well spent.

Regardless of how well fitting a prostheses is, there is a potential for skin breakdown of the residual limb due to overactivity.[5] Athletes will continually push themselves to their limits and beyond. If they are armed with methods to deal with skin breakdown, they will benefit greatly.

Advances in sports medicine for runners was bound to spill over into prosthetics. Of particular use is a skin protection material called "2nd Skin™" (Table I). It is a 1/16" thick piece of gel that is applied directly onto the skin. It prevents friction between the skin and any moving surface. It does not stick to normal skin, yet because of its viscosity, will stay where it is placed. It is perforated so as to let the wound breathe as well as being sterile to prevent infection. 2nd Skin™ absorbs secretions, feels cool, alleviates itching, and can relieve pain.[6]

2nd Skin™ comes with plastic on both sides of the gel material. Before the plastic is removed, cut a piece one third larger than the area to be covered. This allows coverage of the

Figure 2. Applying 2nd Skin™ to a residual limb abrasion.

affected area despite migration. The directions recommend removing the plastic from one side or from both sides. Personal experience has shown that removing the plastic from both sides prevents most migration.

Because 2nd Skin™ is so thin, it does not increase pressure on blisters or abrasions. It prevents most friction and can actually promote healing even during heavy usage. 2nd Skin™ comes in a variety of sheet sizes which can be cut to the size needed and has to be kept in the zip-lock container provided. Unfortunately, it can be used only once and has to be cleaned off the sock after use. It works very well on below-knee amputees, especially when used beneath a sheath. In above-knee amputees, only suction wearers will experience difficulty in usage due to excessive migration from pulling into the socket. Second Skin® is an inert material made from 96 percent water and four percent polyethylene oxide.

Another product which provides excellent friction reduction and is also reusable is "Spenco® Skin Care Pad" (Table I). This product comes in three thicknesses, ½", 3⁄16", and ⅛". The ⅛" thickness produces the least amount of pressure inside the socket. Spenco® Skin Care Pad acts like a second layer of fat to protect the skin from friction or abrasion. It adheres to the skin without sticking due to its viscosity. Made from a reticulated closed cell elastomer, it can be gas sterilized or washed in soap and warm water. It should also be stored in the zip-lock bag and has a shelf life of two years. It is best used as a preventative measure in circumstances where skin breakdown is a danger.[6]

One of the problems with most skin protection materials is that suction socket wearers cannot utilize them. When the amputee pulls into the suction socket, "2nd Skin®" or "Spenco® Skin Care Pads" become displaced and usually do not cover the areas intended. A product that can be of use to suction socket wearers, or any amputee for that matter, comes with a variety of names. It is a transparent dressing with one adhesive side that is paper thin and porous both to air and water. The trade names are "Op-Site," "Bioclusive," "Tegaderm," and "Acuderm" (Table I). This material can be applied directly to the skin and acts as another layer of protection, while still allowing normal dermal respiration and perspiration to occur. It can be left on the skin for four to five days before it needs to be removed. If left on much longer, the epidermis does not get an opportunity to slough off properly.[6]

These products work well to prevent friction, but do not provide any relief for pressure problems. The transparency of these materials allow for continual evaluation of the healing process. There is a problem that the adhesive is quite strong and oftentimes pulls hairs out upon removal. Different brands utilize different adhesives, but in general it is recommended that some soaking of the covered area in warm water will help remove the covering with minimal discomfort. Careful attention should be paid to the application instructions so as to avoid getting it adhered to itself when applying it. Most brands come with a paper backing and application method that allows it to be cut to the desired size.

Until the time when skin abrasions and adherent scars become a thing of the past, we will have the need for skin protection materials. These products can give relief to thousands of prosthetic wearers as well as prevent much discomfort for active amputees. They should become a standard part of the amputee's "survival kit."

Sports Organizations for Amputees

The perceptions that amputees have of their capabilities has risen dramatically in the last decade. Paralleling the growth of competitive

Figure 3. The United States Disabled Ski Team.

sports for amputees has been the organizations that provide the forum for these activities (Table II). Prior to these organizations bringing together amputees from around the nation and the world, there was little opportunity for exchange of ideas on the consumer level.

Organizations such as the "National Handicapped Sports and Recreation Association," sponsor and provide for competitive sports activities. Competition is based on ability and level of amputation with competitive levels ranging from local races to world class and a parallel olympic structure.

The impact of these organizations on the field of prosthetics has been enormous. All of us have fielded questions concerning amputee athletes and their various prostheses. This direction from the people whom we serve has been healthy for prosthetics for many reasons. First, we have had to expand our horizons and adapt technologies and techniques to accommodate these athletic amputees. Secondly, it has created a demand and thus a market for new components to accommodate extra-ambulatory activities. Third, there now exists a forum for amputees to exchange ideas, compare techniques, and services, as well as push each other to greater accomplishments. Another important contribution is the role model aspect of these athletic amputees. They provide inspiration to all of our clientele to continue to expand their perceptions of what is possible.

All of these factors have changed prosthetics. Because of publicity surrounding some of the more astounding accomplishments, not only has the field gained more public recognition, but there is a growing acceptance of us as professionals. These organizations will continue to provide and promote sports and recreation as a normal part of the amputees lifestyle. Not only is it our responsibility and challenge to continue to adapt prosthetics to these activities, but it will play a major role in the future of our profession.[7]

Amputee Sports Organizations
National Handicapped Sports and Recreation Association 1145 19th Street, N.W., Suite 717 Washington, D.C. 20036 301-652-7505
United States Amputee Athletic Association Route 2, County Line Road Fairview, Tennessee 37026 615-670-5453
National Amputee Golf Association c/o Bob Wilson 5711 Yearling Court Bonita, California 92002 619-479-4578
National Wheelchair Athletic Association 2107 Templeton Gap Road, Suite C Colorado Springs, Colorado 80907

Table II.

Conclusion

As leisure time in our society increases, the need to accommodate sports and recreation in our society becomes essential. The perception of the amputee's lifestyle parallels this societal shift. Prosthetics must be able to accommodate this change in our patients' attitudes toward activity. This can best be accomplished through education and communication, as well as further development of componentry geared to the athletically inclined.[8]

The amputee athlete has given rise to a new specialty in our field. The sports prosthetist is now a viable specialist that as professionals we should recognize and refer our patients to. We will continue to provide state-of-the-art prostheses for our active amputees, and armed with information about proper care, they will be among the best athletes in the world.

Author

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Also a below-knee amputee, Riley is a member of the U.S. Disabled Nordic Ski Team and the Vice President of the National Handicapped Sports and Recreation Association.

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