A major aspect of the treatment of patients with lymphedema is the promotion of effective movement of accumulated lymphatic fluid toward the extremity. One well-recognized measure of the rate of lymphatic movement is derived from the observed transit or clearance of an injected radiolabeled using the method of lymphoscintigraphy (1,–4). The goal of this case study was to utilize lymphoscintigraphy to evaluate the potential impact of a 2-phase device (Flexitouch™) on the movement of lymph fluid in a patient with long-standing lower extremity lymphedema.

**PATIENT**

The patient is a 51 year old female who was in a traffic accident in 1976 that resulted in paralysis of both legs. She had a skin graft in 1978 and developed a heel ulcer in 1984. She had lower extremity bilateral lymphedema that was originally diagnosed as lymphedema in 2002 when she underwent bilateral lymphoscintigraphy that showed absence of isotope appearance by 60 minutes at the inguinal nodes. She could walk using braces and two canes. The ulcer on her left heel was still present despite various treatments. In June of 2004 the ulcer was still present and she volunteered to participate in a protocol in which the Flexitouch system would be used in an effort to improve the lymphatic flow in her lower extremities.

**PROCEDURAL APPLICATION**

A baseline bilateral lower extremity lymphoscintigraphy assessment was done (A). This consisted of the injection of 1 to 1.2 millicuries of technetium-99 filtered sulfur colloid in four divided doses using 250 to 300 microliters in a volume of 0.2 ml in each of four tuberculin syringes. Injections were made intradermally and subcutaneously in alternating interdigital web spaces beginning with the left foot and then the right foot between digits one and two and then repeating between the left foot and the right foot between digits two and three. No local anesthetic was used as patient has no sensation in her feet. Immediately after the injection of the radioactive material dynamic imaging was initiated using a GE Discovery VH camera at a rate of 15 seconds per frame for 30 minutes, then 30 seconds per frame for 30 minutes, followed by planar images at 60 minutes of lower extremities and pelvis in three planes. Planar images were obtained at 30 minute intervals. The arrival time of the radioactive material at the inguinal nodes was visualized. After an interval of 44 days (B) another lymphoscintigraphy assessment was done. During these 44 days the patient did not receive any unusual treatment. However, at this assessment the patient was fitted with a Flexitouch System garment on the right entire lower extremity, including the lower abdomen, prior to the determination of the arrival time of the radioactive tracer material at the inguinal lymph nodes. It was hypothesized that use of the Flexitouch system would reduce the transit time for the tracer to flow from the foot injection site to the visualized inguinal nodes.

**RESULTS AND DISCUSSION**

In a normal lymphatic system a typical arrival time following exercise may range from 3 to 8 minutes. The lymphatic transport in this patient is greatly compromised. This fact is well illustrated in Figure A that shows a baseline image taken 15 minutes after the initial foot injections. Both right and left pathways are significantly compromised with the right being somewhat less than the left.

A notable change in this situation is apparent associated with the first use of the Flexitouch system during the second lymphoscintigraphy assessment session. This change is well illustrated in Figure B that can be seen that the initial arrival time of the radioactive tracer on the right has been reduced to about 31 minutes with several inguinal nodes well seen. The first appearance of the radionuclide on the left was delayed as compared to the right but is still 20 minutes earlier than during the baseline assessment. It appears that since the Flexitouch system was applied on the right side for this session, its beneficial effect was most evident on the right side.

Sustained use of the Flexitouch system during the next 28 days was done by the patient. As shown in Figure C this sustained therapy resulted in a near balance between right and left sides with respect of tracer arrival time, with both right and left being much reduced from the baseline pre-Flexitouch therapy.

**CONCLUSION**

Within the limits of a single case study the present results provide very encouraging data suggestive of a potentially important role of the Flexitouch two-phase, automated system in the long term management of lymphedema.