

AUDIT OF THE USE OF KINESIOLOGY TAPE FOR BREAST OEDEMA

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Abstract

Background: Lymphoedema developing in the breast and truncal area after treatment for breast cancer can be challenging to manage and distressing for patients. Kinesiology tape has traditionally been used in sports injuries and is considered effective at improving lymph drainage (Kase et al, 2003). It offers potential as a self-care option for managing swelling in this area. **Aims:** To explore women's feelings and experiences of using kinesiology tape in the breast and truncal area and to establish whether measurable change could be detected with its use. **Methods:** Kinesiology tape was applied weekly to the breast or chest wall for a period of three weeks, and circumference measurements of the chest wall using a standard narrow spring loaded tape measure were recorded weekly. The patients' experiences of using the tape was recorded on a simple questionnaire. **Results:** Ten patients completed the audit. Changes in measurement were difficult to establish but improvements in tissue texture were noted. The completed questionnaires indicated that the tape was comfortable but there were some concerns regarding ability to complete daily hygiene with the tape in place. The need for written information about the tape was highlighted. **Conclusions:** Kinesiology tape offers an additional approach to the management of lymphoedema, particularly in more challenging areas of the body, but decisions regarding its appropriateness for an individual should always be made following an assessment by a healthcare professional.

Key words

Lymphoedema
Breast oedema
Kinesiology tape

Conservative approaches and improved techniques in breast cancer treatment have been welcomed by women who, following a diagnosis of breast cancer, often prefer to consider breast-conserving treatment rather than a mastectomy. These women continue to be at risk of developing lymphoedema following surgical intervention in lymph node areas and research indicates that approximately one-third of women will go on to develop lymphoedema (Mortimer et al, 1996).

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Following breast cancer treatment, lymphoedema most commonly appears in the arm on the affected side. However, over recent years, an increasing number of women who have received breast conserving treatment for breast cancer have been observed

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in clinical practice to also develop lymphoedema in the treated breast area or adjacent truncal area. The breast has the same lymphatic drainage routes as the arm and is therefore also at risk of swelling when lymphatic routes are interrupted during surgery to the axilla. Complex breast reconstructive surgery, which can lead to post-treatment complications such as haematoma and seroma, coupled with the inflammatory process occurring as a result of

radiotherapy to the breast and the lack of muscle within breast tissue (Williams, 2006), all contribute to a reduction in lymph drainage and may be factors in the increased observation of breast oedema in this group of women.

In a paper which proposes risk factors for the development of breast and trunk oedema, Williams (2006) acknowledges the small number of studies which recognise the presence of breast oedema among patients, with the incidence ranging from 6% among patients who have not undergone axillary surgery to 79% following axillary node dissection (Clarke, 1982; Liljegren et al, 1993; Ronka et al, 2004). Subjective clinical examination is frequently relied upon to identify breast oedema, although a study by Ronka et al (2004) concluded that ultrasound was a more reliable assessment method.

The development of breast or truncal oedema can be physically and psychologically challenging for the woman concerned. Linnitt et al (2007) describe the fear and embarrassment associated with breast oedema, as well

as the impact on other members of the family. Management of the swelling has focused on manual lymphatic drainage (MLD) by a trained MLD therapist, usually on a daily basis for a three-week period (Williams, 2006). This approach to treatment means that women with breast and truncal oedema are dependent upon the availability of a suitably trained MLD therapist to provide a treatment that is often financially expensive and time-consuming. Fully trained MLD therapists are not available within all lymphoedema services in the UK and where MLD is available, patients may have to fulfil specific clinical criteria for its inclusion within their treatment plan.

Kinesiology tape has been used for many years in the management of sports injuries (Halseth et al, 2004). More recently, its ability to reduce local swelling and pain and improve muscle activity has resulted in its adoption in clinical practice by lymphoedema therapists to manage areas where lymphoedema occurs. The tape is thought to facilitate myofascial release and increase the re-absorption of lymph in underlying tissues (Kase et al, 2003). Following assessment by a trained healthcare professional, which includes patch testing of the tape before use, the patient can be taught to apply and remove the tape independently. There are no other known side-effects apart from allergy and irritation.

Although manufacturers of compression garments are improving the range of specific compression garments available for the upper torso, lymphoedema in the breast and truncal areas remains difficult to treat with compression garments and MLD remains the treatment of choice in conjunction with appropriate skin care and exercise (Williams, 2006; Linnett, 2007). Kinesiology tape offers an additional, self-care option for the management of swelling occurring in these areas.

The aim of this audit was to explore women's feelings and experiences of using kinesiology tape as an additional treatment for lymphoedema developing

in the breast and adjacent truncal quadrant following treatment for breast cancer; and to establish whether measurable change could be detected with its use.

Background to the audit

Kinesiology tape is a thin, porous cotton fabric similar to the weight and thickness of human skin, with a medical

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grade acrylic adhesive which has a distinctive wave pattern. The fabric is air permeable, allowing the skin to breathe and is capable of a 30–40% stretch beyond its original resting length (Burke and Bailey, 2002). Although it absorbs water during showering, it dries easily and can remain comfortably in place for 3–5 days before replacement is required.

In Japan and the United States the tape has been in use for over 30 years (Kase et al, 1996). It was originally used to treat sports injuries and differs from traditional white athletic tape which is applied to restrict joint movement and allow healing. Kinesiology tape adopts a more therapeutic approach by supporting the muscles, removing congestion from the inflamed or swollen area and allowing the injured body part to maintain free movement without any restriction or structural support (Kase, 2000).

Kase et al (1996) suggest that in sports injuries, kinesiology tape can:

- ▶▶ Correct muscle function by strengthening weakened muscles
- ▶▶ Improve the circulation of blood and lymph by eliminating tissue fluid

beneath the skin by movement of the muscle

- ▶▶ Decrease pain through neurological suppression
- ▶▶ Correct misalignment of injured joints by relieving abnormal muscle tension.

It is the proposed ability of the tape to improve lymph drainage by lifting the skin away from the muscle fascia, facilitating blood flow and drainage of fluids by the lymph system that has captured interest in its ability to become part of a treatment programme for lymphoedema. Research studies carried out to support its use in this area, however, have not yet been published. A recent study by Fu et al (2008) carried out with patients who did not have lymphoedema show that the effects of kinesiology tape on strength, movement, range of motion and pain are small and relatively shortlived. Further study in this area is needed if the theoretical ability of kinesiology tape is to be scientifically supported and proven.

Kerr (1998) reported on the work of Ruth Copee who started using kinesiology tape for oedema in areas that were difficult to treat with traditional methods of compression. After observing Dr Kenzo Kase using kinesiology tape on a patient with post-mastectomy lymphoedema, Copee began using it in her clinical practice and observed positive results. Copee (2009) suggests that the application of kinesiology tape increases the body's ability to drain lymphatic fluid to healthy lymph nodes by influencing the lymphatic system in the following ways:

- ▶▶ Skin: When tape is placed over areas of fibrosis, small convulsions in the tape increase the space between the skin and the muscle which has the effect of lifting the skin, promoting blood and lymph flow and softening the tissues.
- ▶▶ Muscle: Action of the tape on sensory receptors in the skin can improve muscle contraction. Deeper lymphatic vessel function is enhanced by the nearby pumping action of muscle contraction and relaxation.
- ▶▶ Circulation: The convulsions in the tape improve the ability of the blood

to flow in and out as the space between the skin and muscle is increased.

- ▶ Neurological: Pressure from excess fluid on sensory receptors in the skin causes pain, numbness or reduced sensitivity. Removal of the excess fluid by the action of the kinesiology tape leads to a reduction in pressure and improves the ability of the receptors to communicate with the brain. A less reactive response in the body promotes healing.
- ▶ Respiratory: Thoracic pressure changes draw lymph from the extremities using a vacuum effect. Taping of the diaphragm can improve respiratory capacity by increasing expiratory volume (Copee, 2009).

Training courses in techniques of kinesiology tape application for the management of lymphoedema have subsequently been developed by Kinesio UK (2009). The tape, however, is not promoted as a 'do-it-yourself' treatment, and it is recommended that it is used by trained therapists as part of a treatment regimen for lymphoedema alongside other aspects of management including compression garments.

Copee (2009) suggests that the correct application of kinesiology tape to areas of the body can assist in the reduction of lymphoedema in these areas. As the trunk, head and neck are difficult to treat with compression garments, kinesiology tape is thought to be of particular benefit in managing lymphoedema in these areas.

Audit preparation

Local permission to complete the audit was gained in order to evaluate kinesiology tape as a new product and establish its role in the management of lymphoedema of the breast or chest wall among patients attending a lymphoedema clinic.

All members of the team underwent training in the use and application of the tape to enable its use with patients with lymphoedema.



Figure 1. Kinesiology tape on breast area.

Methods

Subjects

The audit was carried out within a lymphoedema service in South West London among a small group of patients (10) who presented with breast and chest wall oedema following surgery and/or radiotherapy for breast cancer. Patients suitable for inclusion in the audit process were identified during a clinical assessment at their routine appointment in the lymphoedema clinic. Inclusion criteria for the audit was determined by clinical observation and the presence of one or more of the following;

- ▶ Presence of *peau d'orange*
- ▶ Marking from clothing
- ▶ Changes in texture in comparison to contralateral breast
- ▶ Reports of an increase in size
- ▶ Heaviness, fullness and discomfort in the area of swelling.

Patients

All patients were asked about any known skin conditions or sensitivities and, following verbal consent to participate in the audit, a patch test of the tape was applied to the contralateral side of the body for 24 hours to exclude any possible sensitivity to the tape. Patients were advised to remove the tape at the first sign of any visual or sensory irritation and were told that if this occurred they could not proceed with the audit.

During the audit period, patients were required to attend the clinic once a week for three consecutive weeks to undergo chest wall measurements, return their questionnaire and to have the tape re-applied.

Application of the tape

The tape was applied to clean, dry, stretched skin, to initiate a recoil effect as the skin returned to its resting position at each of three consecutive appointments. This creates a massaging effect as the tape remains in position during daily activity and exercise. This continued action by the tape directs lymph away from an area of congestion to an area where it can drain freely through the lymphatic channels (Copee, 2009). Kinesiology tape adheres more quickly to the skin if it is lightly rubbed after application because it is heat sensitive.

The tape was applied in the format of a fan (Figure 1) to direct lymph fluid towards less congested lymphatic pathways and nodes and therefore reduce swelling, although the exact position of the tape varied according to the patient's individual circumstances. The arms of the fan direct lymph flow towards the anchor and lymph is then able to drain away.

In the case of the patient with bilateral oedema, the lymph flow was towards the groin nodes.

Data collection

Following verbal consent and completion of the patch test, each patient was offered a series of weekly clinic appointments for a period of three weeks. Their weight was recorded at each visit.

Measurements

Circumference measurements of the chest wall were taken using a measurement technique that was agreed between each therapist before starting the audit. The method and guidelines for chest wall measurement are shown in *Figure 2*. Care was taken to lay the measuring tape horizontally without any slack on the tape. Whenever possible, two therapists were present when measurements were taken in an attempt to ensure standardisation of technique.

Kinesiology tape

The tape was applied to the chest wall or breast and left in place for up to seven days, depending upon the adherence of the tape. Patients were advised to continue with all other aspects of lymphoedema management and to continue daily activities. Advice was given on patting the skin dry after bathing. At each appointment, the therapist removed the tape if still in place (loosening of the tape can be influenced by excessive sweat, activity and bathing), the skin was assessed for sensitivities and the chest wall re-measured. The skin was then carefully washed and dried and the tape reapplied. At appointment three, two weeks after starting use of the tape, the tape was again removed, the patient re-measured and given the option of continuing with the tape. At this time the patient or a relative/carer was shown how to apply the tape to enable ongoing management.

Questionnaire

In order to establish the patient's experiences of using the tape, a questionnaire was completed at the end of the first week (*Figure 3*). This included information regarding where the tape was applied and for how long, the colour and sensation of the skin during and after the taping, positive and negative effects of the tape and its

Chest wall measurements

Guidelines:

- ▶ The patient should wear the same bra each time measurements are taken.
- ▶ Measure the chest circumference by placing the tape measure around the chest as close to the axilla as possible. Mark the point where the tape lies over the rib cage.
- ▶ Measure and record the distance from the central clavicle point to the mark you have made on the rib cage. This will be your set starting point for subsequent measurements.
- ▶ Mark measurement points at 4cm intervals down as far as the umbilicus.
- ▶ Measure and record the circumference of the chest and girth at each of these points clearly.

Date	Measurements	Date	Measurements	Date	Measurements
Axilla		Axilla		Axilla	
Starting point			(As before)		(As before)
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
10		10		10	

Figure 2. Kinesiology tape project.

comfort. A similar questionnaire was given to the patients to complete after the second week (*Figure 4*).

Results

Patients

Ten patients were included in the audit. Each had undergone axillary node clearance, and nine out of the ten patients had also received radiotherapy to the breast or chest wall. The tenth patient who had not received radiotherapy was being treated with Herceptin for metastatic disease.

Eight of the patients had clinically discernable and self-reported breast oedema (one of those bilateral), and two had chest wall oedema. Two patients had breast swelling only, whereas the rest had breast and arm oedema. All patients had previously been given

advice on skin care, exercise and general information on the management of their breast and arm lymphoedema. Additional aspects of lymphoedema management (compression garments, MLD and/or simple lymphatic drainage and intensive treatment with bandaging) had also been used according to individual clinical need. Despite these interventions, the patients included within the audit had not observed any improvement in their oedema over time.

Measurements

The measurement data showed a general decrease in chest wall measurements during treatment with the tape. One patient reported a reduction in breast oedema but on measurement the abdominal circumference had increased. Although the patient's weight was recorded at

Evaluation of kinesiology tape — questionnaire 1

Thank you for agreeing to help us evaluate kinesiology tape. We are interested in your use of the tape over a seven-day period and would value any comments you have to make.

The tape has been applied by your lymphoedema therapist who has received training in its application. We would like you to leave it in place for as long as you feel comfortable, but for a maximum period of seven days. If you experience any problems with the tape, or at any time wish to discontinue wearing it, please remove the tape carefully in the direction of hair growth. You may find it easier to remove while showering or bathing.

We are particularly interested in the acceptability of the tape to patients during their daily life and whether the tape has any effect upon the skin. To help you provide us with some feedback, please consider the following areas.

- 1) Has the tape been applied to an area of the body where you have lymphoedema? YES NO
- 2) Please identify the area where the tape has been applied.....
.....
- 3) Please enter the date that the tape was applied.....
- 4) Please enter the date that the tape was removed.....
- 5) On the day of removal, please describe the colour and sensation of your skin in the area where the tape had been applied.....
.....
- 6) Was the tape comfortable while in place? YES NO
Comments:.....
.....
- 7) Has the tape had any effect upon your skin? YES NO
Comments:.....
.....
- 8) Have you had any concerns about the tape while it has been in place?
YES NO
Comments:.....
.....
- 9) Has your daily personal hygiene been changed in any way because of the tape? YES NO
Comments:.....
.....
- 10) Please add any other comments you may have about the tape.....
.....

Thank you for your help. If you would like to know the results of this evaluation, please contact one of the lymphoedema team on XXX

each visit, this was not accounted for in the results obtained. Measurements may have been influenced by factors such as abdominal bloating, hormonal changes, heat and the time of day that the measurements were taken.

Patient questionnaires

All ten patients reported the tape to be comfortable while in place. One patient mentioned her skin being itchy and warm at times, another commented on the tape rolling, but both still reported the tape as comfortable on the questionnaire.

When asked to describe the colour and sensation of their skin when the tape was removed, four patients reported a slightly pink colour to the skin. Four patients felt that there was no change in the colour of the skin, but two of these mentioned indentation marks from the tape. One patient also reported indentation from the tape and the appearance of a white stripe effect on the skin where the tape had been. One patient found that she had a red rash on the skin at the anchor site and the edges of the tape. Only one patient mentioned a little more feeling/sensation in the area where the tape had been, the other nine did not report any changes.

The main concern for seven of the patients was that they had to make changes to their daily hygiene routine. Only three of the patients did not find this was necessary. Three mentioned the tape being damp after showering and having to wait for it to dry before dressing. One patient felt unable to shower daily and another strip washed while the tape was in place. Others mentioned being unable to bath properly or finding showering more awkward. One patient was cautious when bathing but did not feel that this was a problem.

When reviewing the positive and negative experiences of the patients, seven reported an improvement in either the swelling or the texture of the tissues in the treated area.

Examples of positive comments included:

Figure 3. Questionnaire one for the evaluation of kinesiology tape.

Worthwhile — has helped skin feel softer, less lumpy and swollen.

Improvement in orange peel skin, scar tissue feels softer, breast looked smaller.

Possibly reduced breast lymphoedema — pleased.

Tape helped shrink breast tissue — will go on using independently.

Tape makes breast feel more supported at night.

Reduction in hardness under breast and outer side of breast by the scar.

Surprisingly uncumbersome to wear. Stayed stuck on well. Hope it can be used on hands and arms eventually.

Only a few negative comments were made by the patients. One patient mentioned that the tape caused aching above the breast, another felt the tape did its job in one area but moved fluid somewhere else. One patient was disappointed that there was no obvious change after the first week of treatment.

Seven out of the ten patients taking part in the audit expressed a wish to continue its use and the method of application was taught to each of these patients. One patient then stopped treatment as it was found to be too difficult to apply, and another stopped as the need to continue taping was not perceived as necessary.

Out of the three patients who were not taught the techniques, two made the decision not to be taught as they did not perceive any improvement in their symptoms. The other patient was unable to apply the tape independently but continued being seen by a therapist once a week to have tape applied.

Therapists' responses to the taping

General comments from the therapists applying the tape included the fact that the tape was time-consuming to cut and apply, and that continuity of treatment usually depended upon the patient or a relative being able to apply the tape. However, the time involved was significantly less than the time required for daily MLD sessions over a three-week period. Continuity in use of the tape for some patients meant weekly clinic visits with a resulting impact upon clinical time within the service.

Evaluation of kinesiology tape — questionnaire 2

Thank you for helping us to evaluate the use of kinesiology tape. Now that you have completed a two-week trial of the tape we would be interested to hear your views about the way your swollen area feels now. In questions 1–3, your views can be combined with those of your therapist.

Please consider the following areas.

11) Have you observed any visible difference in the area where the tape was applied over the past two weeks?

Please describe:.....

12) Have you observed any alteration in the sensations you normally experience in the area where the tape was applied over the past two weeks?

Please comment:.....

13) Have you observed any change in the areas surrounding the tape over the past two weeks?

Please comment:.....

14) Was the tape comfortable while in place? YES NO

Comments:.....

15) Has the tape had any effect upon your skin? YES NO

Comments:.....

16) Have you had any concerns about the tape while it has been in place? YES NO

Comments:.....

17) Has your daily personal hygiene been changed in any way because of the tape? YES NO

Comments:.....

18) Please add any other comments you may have about the tape.....

Thank you for your help. If you would like to know the results of this evaluation, please contact one of the lymphoedema team on XXXX

Figure 4. Questionnaire two for the evaluation of kinesiology tape.

Therapists also commented that circumference measurements of the chest wall were difficult to record and that clinical examination of the area where the tape had been applied, combined with the patient's perceived response to use of the tape, was a more constructive evaluation of the tape.

Discussion

The audit highlighted the need for written information to be provided for patients using kinesiology tape. This would include an explanation of the technique of application and care of the area during taping. The inclusion of a body chart in the patient's lymphoedema file would ensure that the area being treated was clearly identified. For the purpose of the audit, a drawing was used in the patient's treatment notes.

Obtaining consistent and accurate measurements proved difficult for a number of reasons. The breast and chest area were difficult to measure with a tape measure. It appeared that the start point varied between therapists, despite attempts to standardise this. All patients were measured in their bra, which created a curve where the breast or prosthesis was positioned, and this was thought to influence the position of the tape measure and resulting measurement obtained.

Interestingly, it appeared that measurable changes in swelling and improvements in tissue texture were noted towards the end of the second week of treatment, indicating that time was required before any improvement could be expected.

Williams (2006) points out that there is no fully validated method of measuring oedema of the breast and trunk. Other approaches that could have been used include tissue tonometry, bioelectrical impedance and skin fold callipers.

An important outcome of the audit was the removal of one patient from a waiting list for treatment with MLD, as her symptoms significantly improved by use of the tape combined with a

compression garment. This meant that MLD was no longer perceived to be necessary.

Conclusion

The use of kinesiology tape offers an additional approach to the management of lymphoedema, particularly in the breast and truncal area of the body. Historically, such cases have depended upon treatment with MLD, which, if provided by a private therapist, is time-consuming and expensive. Although the range of compression garments suitable for the breast and truncal area is expanding, these are not yet available on prescription and are expensive to buy. By comparison, a roll of kinesiology tape is relatively inexpensive and lasts for a number of applications over several months.

While the use of kinesiology tape in isolation from other aspects of lymphoedema management has not been studied, this small audit of patients using kinesiology tape for lymphoedema of the breast or chest wall area reports some positive findings upon which further research can be developed. However, it must be acknowledged that use of the tape is not a do-it-yourself approach to lymphoedema management, and decisions regarding its appropriateness for an individual must always be made following an assessment by a healthcare professional. JL

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Key points

- ▶▶ There are some positive findings upon which further research can be developed.
- ▶▶ All patients reported the tape to be comfortable while in place.
- ▶▶ One patient's symptoms significantly improved with the use of the tape combined with a compression garment.
- ▶▶ The use of tape is not a do-it-yourself approach to lymphoedema management.
- ▶▶ Written information needs to be provided for patients using kinesiology tape.

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