

Complete Decongestive Physiotherapy (CDPT) Helps in Management of Post Mastectomy Lymphedema: Case Series Report Part 1

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Abstract:

Lymphedema is defined as the abnormal accumulation of protein rich fluid dysfunction of the lymphatic system, which is a common sequel of cancer therapy. The incidence is highest among patients who have undergone lymph node resection and irradiation.

Various studies had been undertaken to develop less invasive treatments of lymphedema management. Complete decongestive physiotherapy has evolved rapidly over the past decade.

This article is aimed to describe very promising results of CDPT given to patients with diagnosis of post mastectomy lymphedema.

The data represented in this article were retrospectively collected and reviewed. Patients received 15 sessions of CDPT 6 days a week, patients were given extensive patient education during the first consultation about general do's and don'ts, skin care.

Along with resolution of lymphedema, there was good improvement in other symptoms such as pain and paraesthesia. Patients also reported improvement in their psychological well being.

Observation and conclusion drawn from this case series review suggest that inclusion of CDPT in management of post mastectomy lymphedema will not only be useful in resolution lymphedema but also helps in reducing pain, paraesthesia and improving overall quality of life of patients, perhaps more rigorous research and trials with efficient methodology required to establish CDPT as treatment of choice for post mastectomy lymphedema.

Keywords: Lymphedema; CDPT; MLD; Remedial exercises; Pneumatic compression therapy; Compression bandaging; Multi-layer bandaging.

Introduction

Lymphedema, defined as the abnormal accumulation of protein rich fluid due to dysfunction of the lymphatic system, it is a common sequel of cancer therapy. The incidence is highest among patients who have undergone resection and irradiation of a

lymph node bed.[1,2]

Lymphedema, developed after mastectomy, which is characterized by edema in the arm and in close parts of the body, close to the arm which could cause cosmetic deformity, physical disorder, loss of function, cellulitis, lymphangitis, and sometimes lymphangiosarcoma. Lymphedema is a chronically, progressive, multifactorial process.[2,3,4]

There are various studies describing risk factors for lymphedema occurrence, being overweight is an important modifiable risk factor for lymphedema. Axillary radiation, surgery that is more extensive, chemotherapy, and active cancer status also were predictive of lymphedema.[5,6]

Lymphedema has both physical and emotional concerns. There is swelling and tightness in the affected arm and at the same

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time, patients complained about reduced flexibility, fatigue, weakness, hopelessness, pain, heaviness, infection, impairment in ability to perform routine daily tasks.[7,8,9]

Lymphedema if not controlled, can result in a lot of complications. The most problematic complications, an increase in repeated infections rate, reduced local immunity in the affected area, serious restraint in mobility which causes to difficulty in daily activities, serious social and emotional problems and changes in the skin.[2,3,4]

Recently, increased attention has been focused on the modification of anti-cancer therapies in an effort to minimize lymphatic compromise. Sentinel lymph node biopsy is an example of a surgical procedure developed to preserve lymphatic function. Concurrent with the development of less invasive treatments, the field of lymphedema management has evolved rapidly over the past decade.[1] Combined manual therapy, often referred to as complete decongestive physiotherapy (CDPT), has emerged as the standard of care. CDPT combines compression bandaging, manual lymphatic drainage (a specialized massage technique), exercise, and skin care with extensive patient education.[10,11]

Methods

Study area and population

This case series study was done retrospectively at BLK super speciality hospital. Various patients with the diagnosis of lymphedema seen at BLK cancer centre being referred for rehabilitation during the year 2011-2013, were reviewed retrospectively. As patients had wide range of different characteristics such as grade of oedema varied from grade 1-2, lower limb and upper limb edema. Some of patients had only radiotherapy and some had lymph node resection as well as radiotherapy. In this case series reports as part 1 we have represented the cases with diagnosis of lymphedema post mastectomy which were more than 80% of cases treated in department of physiotherapy

Picture 1: A lymphedema patient



and rehabilitation during above said period.

Patients

Following criteria were considered to include cases for this retrospective case series report:

- MRM with axillary lymph node clearance
- Lymphedema Grade-1
- No significant neuropathy sign
- No obesity (at time of intervention, it is being calculated as per WHO criteria, BMI > 30 kg/m² were considered obese)

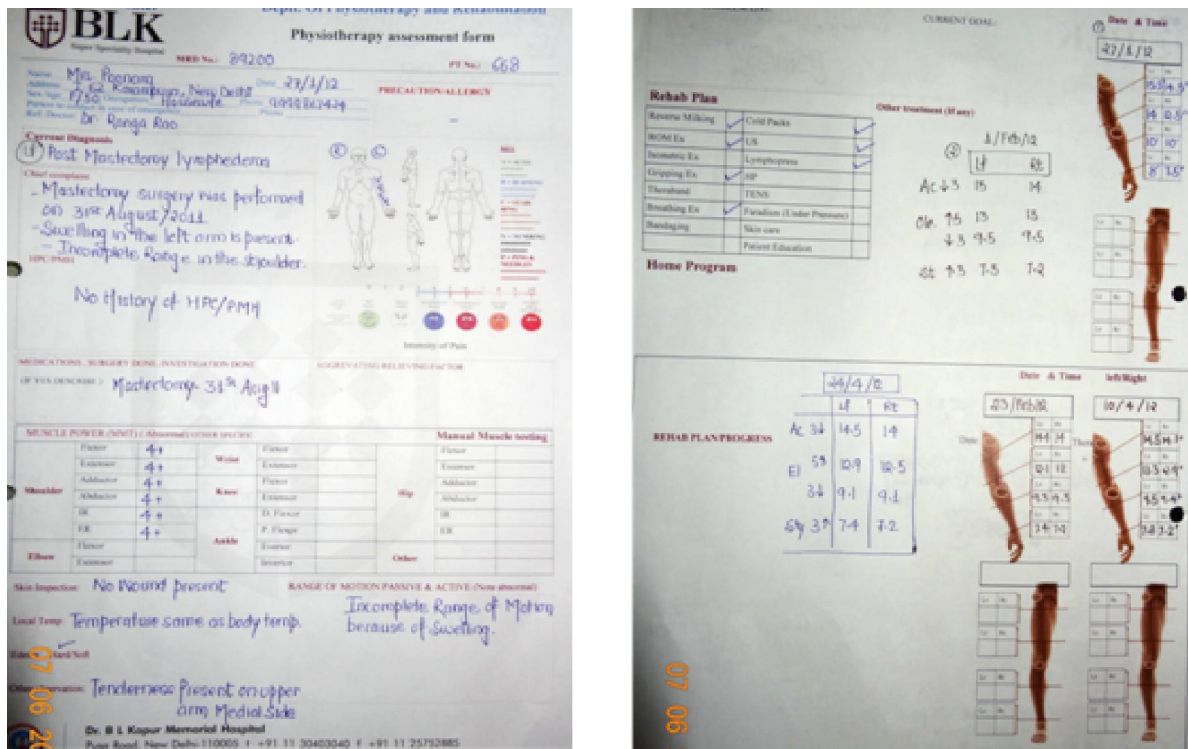
A series of 46 consecutive patients with diagnosis of lymphedema between October 2011 and Feb 2013 being referred to department of physiotherapy & rehabilitation, BLK super speciality hospital. These patients' medical/treatment record were screened. Among these 46 patients 32 patients had diagnosis of upper limb lymphedema, 23 patients were excluded from further data and intervention review because of non-compliance to therapy, uncompleted entire session regimen, obese and associated comorbidity, those who could not tolerate CDPT (n=4) and based on other criteria as mentioned above. 7 patients irregular during therapy sessions, remaining 4 patients data were critically analysed and are presented in this report.

Assessment of patient

Assessment of patients were taken of specific lymphedema assessment forms (Figure: 1).

Apart from clinical history, general skin

Figure 1: Assessment form used for assessment of patients



condition and type of edema, following were assessed:

- Pain using VAS scale
- Detail sensory examination
- Limb girth measurements were taken every 3rd day at following key points:
 - o 3 inch below acromion process (in relation to axillary fold)
 - o 3 inch above cubital fold (mid arm)
 - o 2 inch below cubital fold (mid forearm)
 - o 1 inch above palmar crease (wrist)

Both sound limb and affected limb were measured and recorded. Summary of measurement given below in table 2.

Intervention

Intervention given to all patients included complete decongestive physiotherapy (CDPT)

Components of CDPT we used in our intervention

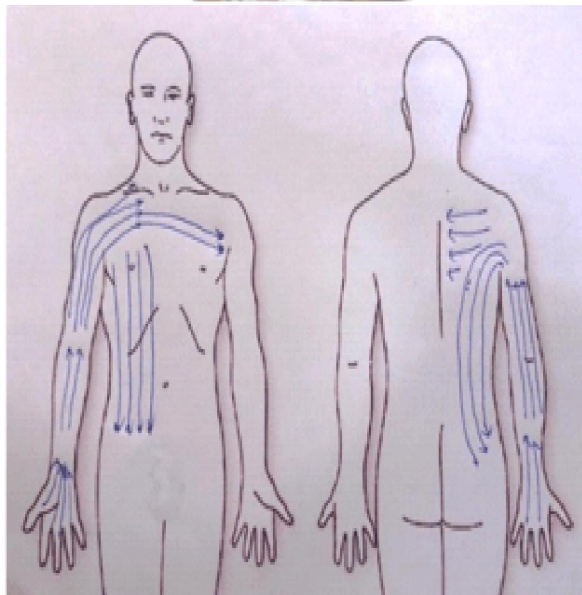
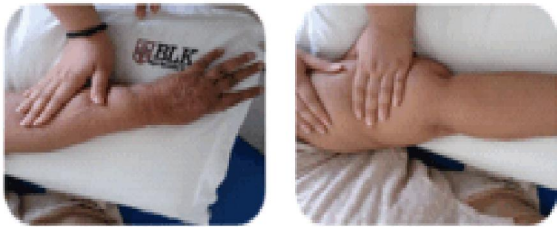
Manual lymphatic drainage

Manual lymphatic drainage therapeutic technique is used for reducing edema and symptoms related with edema by accelerating lymphatic drainage.[1,3] The aim of MLD along the extremity is to provide fluid drainage.[3] Manual lymphatic drainage, consists of hand motions by the therapist on the skin and subcutaneous tissue of patient. Applied pressure is very soft, for suiting the lymphatic pulse beat, applied motions are slow. Every manoeuvre is applied from distal to proximal. Manual lymphatic drainage stimulates the internal contraction of lymphatic channels. If interstitial space concentration of protein is reduced, it provides drainage of obstructed lymph fluid.

Sequential pneumatic compression therapy

Pneumatic compression tools used to treat acute and chronic lymphedema in order to activate extra lymph liquid in affected area. The usage of pneumatic compression tools is contraindicated in acute deep vein thrombosis and inflammatory edema. Generally, these

Photograph 2: Showing Modified manual lymph drainage in process



tools work by applying regular sequential pressure or various-degree pressure to an extremity. Most of tools allow pressure changes between 0 and 300 mmHg. Therapeutic rate depends on diagnosis, but it is usually between 30-60 mmHg.[12]

Multi-layer Compression bandaging

Compression bandaging is used to reduce the increased risk of edema and compensate for the elastic inability of the skin after the

Photograph 3: Showing typical pneumatic compression therapy tool applied on lymphedema patient



decrease of volume. Compression bandaging, increases lymphatic flow and decreases the accumulated protein, increases venous return, shapes suitability and decreases the sizes of the arm, continues the skin wholeness, and protects the arm from probable traumas. The success of compression bandaging depends on patient compliance and cooperation.[1,7,8]

Compression is applied with short stretch bandages. Short-stretch, inelastic bandages have high working pressure and principally use runner strength for muscular system.[1] Compression bandaging is applied from distal to proximal after massage in order to make the fluid flow continue through new ways and avoids the fluid recycling to the edematous area.[3,7,8] Bandages, according to their features, are applied by trained lymphedema therapists. When the compression bandages are correctly applied, they help decrease swelling and pain. There are bandages in different sizes and they provide pressure at most to 50 mmHg from 20 to 30 mmHg.[9]

Exercise

Exercise is an important part of complete

Figure 2: Showing various steps applying compression bandaging

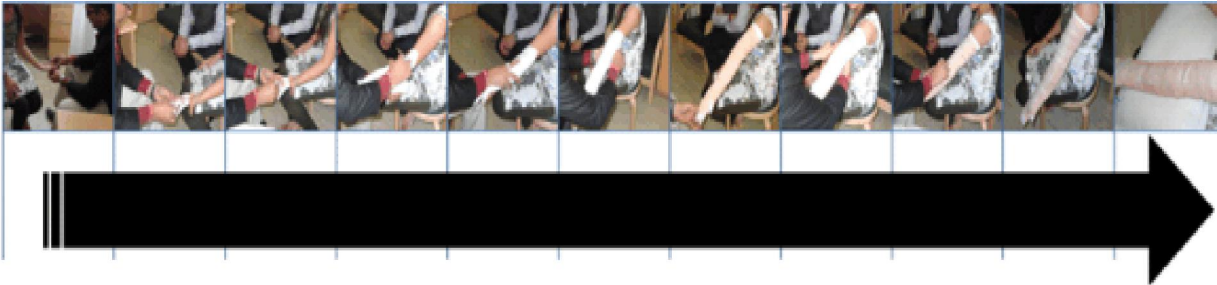


Figure3: Different layer used in multilayer compression bandaging



decongestive physiotherapy for lymphedema management. Therapeutic exercise helps lymph flow and increases the reabsorption of proteins.[9] Exercise increases the physical function of the arm locally and systemically by stimulating the inner contractility of the lymph muscles.[5] The primary role of the lymphatic system during exercise is to help the regulation of tissue volume and to create pressure by carrying liquid and plasma proteins emanated through interstitial interval from the tissue to the cardiovascular system.[12,13] It is determined that exercise did not aggravate the secondary lymphedema

for women post breast cancer.[12]

Patient education & Skin Care

Patients must be educated about do's and don'ts to minimise risk of lymphedema. The aim of skin care is to minimize the dermal colonization of bacteria and fungi, in order to control the dryness. Daily cleaning with oil based mineral soaps removes the skin rash and bacteria from the environment while moisturizing the skin.[12,14] The skin must be cleaned with a non-abrasive soap. It is important to keep the nails trimmed, but not

Table 1: Showing summarised detail of intervention plan

Intervention	Frequency	Duration	Description
Modified MLD	6 day a week	30-40 minute session	Consisted of soft pressure superficial technique consisted of circular and longitudinal motion followed by deep reversed milking technique.
Pneumatic compression therapy	6 day a week	20 + 20 minute session	20 minute on sequential rhythmic compression mode followed by 20 minute sequential continuous draining mode.
Compression Bandaging	6 day a week	As applicable	Multilayer compression bandaging applied after every session, patients were instructed to reapply the outer most elastic crepe bandage if become loose, bandage were removed before next session.
Remedial exercises	6 day a week	10 minute	Remedial exercises consisted of ROM exercises for all major joints of upper extremities. Sub maximal strength training with mild theraband

Table 2: Showing limb girth measurement of all 4 cases and total reduction after 15 CDPT sessions

	CASE 1					CASE 2					CASE 3					CASE 4				
	1ST ASSESS		AFTER 15 CDPT SESSION		Total Reduction	1ST ASSESS		AFTER 15 CDPT SESSION		Total Reduction	1ST ASSESS		AFTER 15 CDPT SESSION		Total Reduction	1ST ASSESS		AFTER 15 CDPT SESSION		Total Reduction
	Sound limb	Affected limb	Sound limb	Affected limb		Sound limb	Affected limb	Sound limb	Affected limb		Sound limb	Affected limb	Sound limb	Affected limb		Sound limb	Affected limb			
3 inch below acromion process (in relation to axillary fold)	14.5	15.5	14	14.5	1	13.5	15	14	14	1	13	13.5	13.5	13.5	0.3	12.8	13.4	12.1	12.1	1.3
3 inch above cubital fold (mid arm)	12.5	14	12.5	12.9	1.1	14.9	14	13.6	14	0.9	11.5	12	10.8	10.8	1.2	11	12.2	11.5	12	0.2
2 inch below cubital fold (mid forearm)	10	10	9.1	9.1	0.9	10.9	10.9	10	10.5	0.9	10	11.5	9.5	10.2	1.3	8.9	9.2	8.5	9	0.2
1 inch above palmar crease (wrist)	7.5	8	7.4	7.2	0.4	9	8.5	9	9	0	7.5	9	7.8	7.9	1.1	7	7	7	7	0

to cut the cuticles. Manicures and pedicures are not recommended which could be affected by lymphedema because the unsuitable technique and improperly sterilized equipment can cause infection. The skin must be kept safe from traumas.[3,7,12,14]. Above explained

intervention plan is summarised in table 1.

Results & Discussion

In all cases reduction in circumferential Physiotherapy and Occupational Therapy Journal

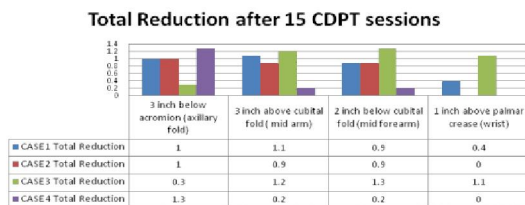
Table 3: Showing clinical characteristics of patients

Case	Case ID	Sex	Age	BMI	Edema grade	Neuropathy signs	Onset after surgery	Skin Changes	Pain
1	3	Female	63 yrs.	22.9kg/m2	Grd 1	No	After 2 year	No	VAS 6
2	8	Female	52 yrs.	25.8kg/m2	Grd 1	No	Within 2 year	No	VAS 6
3	9	Female	62 yrs.	28.9kg/m2	Grd 1	No	Within 2 year	No	VAS 7
4	10	Female	54 yrs.	28.4kg/m2	Grd 1	Tingling sensation occasional	Within 1 st year	Very mild	VAS 8

Table 4: Showing total reduction at various measurement key points (measurement unit in inches)

	CASE 1	CASE 2	CASE 3	CASE 4
	Total Reduction	Total Reduction	Total Reduction	Total Reduction
3 inch below acromion (axillary fold)	1	1	0.3	1.3
3 inch above cubital fold (mid arm)	1.1	0.9	1.2	0.2
2 inch below cubital fold (mid forearm)	0.9	0.9	1.3	0.2
1 inch above palmar crease (wrist)	0.4	0	1.1	0

Figure 4: Bar chart showing total reduction after 15 completed CDPT sessions (unit inches)



girth were achieved, maximum reduction note in area where maximum edema was present. Benefits in other symptoms such as pain was archived one case that reported pain in shoulder at first assessment, VAS 8 was reduced to VAS 4 after 15 session, remaining 3 case VAS score after 6 session was 0.

Summarised finding are mentioned in table 3.

Conclusion & Clinical Recommendations

This retrospective case series review suggests that 15 session complete decongestive physiotherapy is effective in the management of lymphedema post mastectomy, its being observed that it helps in reducing the circumferential girth of limb caused by excessive protein rich fluid collection, thus reducing undue pressure and stretch on peripheral nerves and other soft tissue. It is also observed that edema become soft, well-structured patient education helped patients to manage their lymphedema effectively and also their psychological well being were enhanced.

We recommends that CDPT should be considered in management of lymphedema post mastectomy, perhaps we must facilitate prospective clinical controlled research on this

subject with well-structured methodology to establish its efficacy, this retrospective case review has its own methodological limitations, although this report has given us strong background to facilitate more rigorous research in this area.

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