Breast Cancer and Malignant Melanoma Preoperative Lymphoscintigraphy in "Dharmais" Cancer Hospital

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ABSTRAK

Pemeriksaan limfoskintigrafi sebagai pemetaan kelenjar getah bening preoperatif telah banyak diteliti khususnya pada pasien kanker payudara dan melanoma maligna sebagai bagian dari prosedur sentinel node. Prosedur ini telah diterapkan pula di RS. Kanker "Dharmais" dimana dilakukan injeksi isotop preoperatif, injeksi *blue dye* dan penggunaan gamma probe intraoperatif.

Dilaporkan 48 pasien kanker payudara dan 5 pasien melanoma maligna yang menjalani prosedur limfoskintigrafi. Sebanyak 75.7% dari 37 pasien *breast conserving treatment* ditemukan positif limfoskintigrafi sedangkan seluruh pasien melanoma maligna didapatkan hasil positif limfoskintigrafi. Dengan menggunakan *blue dye* dan gamma probe intraoperatif, sentinel node dapat diidentifikasi walaupun hasil limfoskintigrafi negatif. Preoperatif limfoskintigrafi merupakan komplemen prosedur sentinel node dimana hasil pemetaannya akan memberikan arahan saat operasi.

Kata kunci : kanker payudara, melanoma maligna, limfoskintigrafi, sentinel node, *blue dye, gamma probe, breast conserving treatment*

ABSTRACT

Lymphatic mapping with lymphoscintigraphy has already highlighted by investigators as a phase in sentinel node procedures. This procedure has already implemented in Dharmais hospital and consist three tracers which are comprised radioisotope, blue dye and gamma probe.

We reported 48 breast cancer patients and 5 malignant melanoma patients which were undergone pre operative lymphoscintigraphy. There were 75.7% of 37 (82.3%) patients with breast conserving treatment have positive lymphoscintigraphy and all malignant melanoma patients were positive. Sentinel node were identified even in negative lymphoscintigraphy using blue dye and gamma probe.

Pre operative lymphoscintigraphy is a complement of sentinel node procedure which will direct surgeon during surgical procedure.

***Key Words** : breast cancer, malignant melanoma, lymphoscintigraphy, sentinel node, blue dye, gamma probe, breast conserving treatment*

INTRODUCTION

Since the value of lymphatic mapping is highlighted by many investigators such as in penile cancer, malignant melanoma, gynaecological cancer also gastrointestinal cancer there are increasing knowledge about lymphnodes, especially lymphatic pathway and its influence in clinical application. Lymphoscintigraphy as part of examination to visualize lymph nodes has an important role to assist surgeon intraoperatively to identify sentinel node.[1]

Clinical application of sentinel node procedure in malignant melanoma and breast cancer have been reported by reseachers, and this procedure gain more data to prove that lymphnode biopsy is worthwhile for patients.

Standard lymphatic mapping technique is consisting three tracers which are comprised radioisotope, blue dye and gamma probe. Those tracers complemented each others to identify sentinel node and to have the optimal result interdiciplinary working team is an

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important issue.[1,2]

We reported forty eight patients who underwent preoperative lymphoscintigraphy and included our first patients without gamma probe, later we performed also in node negative advanced breast cancer. Although malignant melanoma case was not frequently found in our institution, we reported 5 cases of malignant melanoma.

PATIENTS AND METHODS

We were conducting prospective study from Februari 2001 until Februari 2003, and there were 50 patients who were performed pre operative lymphoscintigraphy. The main reason for this study was axillary perseverance in breast conserving treatment (BCT) patients. In this study we performed lymphoscintigraphy in BCT patients and patients clinically negative axillary node.

We performed lymphoscintigraphy, blue dye injection and without intraoperative gamma probe, in 8 patients and then in 40 patients with intraoperative gamma probe. Two patients were not in inclusion criteria, 1 case was a stage IV with lung metastasis but lesion in breast undetected before and other case was a recurrence in other quadrant of the breast. Both of cases were clinically negative axillary node.

There were five malignant melanoma patient which were in stage III with enlargement of lymphnodes, but 1 patient was Clark IV and non palpable inguinal lymphnode.

Preoperatively all the patients underwent dynamic and static lymphoscintigraphy which were injected peritumorally in breast cancer and intradermally in malignant melanoma with 1-2 mCi nanocolloid (Cis Bio, approximately 100 nm). Dynamic studies performed for 20 minutes, 30 sec/frame and static studies in 2 and 4 hours after radioactive injection with anterior and lateral position. Surgery was performed 16-18 hours after radioisotope injection.

Approximately 5 to 10 minutes before surgery we injected peritumoral or intra dermal of 1-2 ml blue dye. Gamma probe (Neoprobe 2000) used to localize sentinel node before skin incision. Blue nodes which were identified and also positive counts with gamma probe were dissected and examined in department of pathology.

RESULT

LYMPHOSCINTIGRAPHY IN BREAST CANCER

From the first 8 patients there were 3 cases with negative lymphoscintigraphy and all of these patients were histologically negative of metastasis in lymphnodes. In 3/8 (37.5%) patients were not found any blue node during surgery. But 2/8 patients (25%) with negative lymphoscintigraphy intraoperatively we found blue nodes and tract. One patient with negative preoperative lymphoscintigraphy and non blue node was found, histopathological finding was ductal carcinoma in situ (DCIS)

Table 1. Preoperative lymphoscintigraphy without gamma probe during surgery.

Preoperative Lymphoscintigraphy	Blue Dye Injection	
	Blue Node	Non Blue Node
Positive	2	3
Negative	2	1
Total	4	4

Preoperative lymphoscintigraphy result with lesion size were summarized in table 2. In 4/6 (67%) non palpable lesions showed negative preoperative lymphoscintigraphy and also negative node metastasis. Lesion size less than 30 mm were found 28/37 (75.7%) of patients with positive lymphoscintigraphy.

Table 2. Breast lesion and preoperative lymphoscintigraphy findings.

Preoperative Lymphoscintigraphy	Size of lesions			Total
	npbl	≤30 mm	>30 mm	
Positive	2	28	4	34
Negative	4	9	1	14
Total	6	37	5	48

In negative lymphoscintigraphy blue nodes were found in 4/11 (36.7%) patients. On the other hand blue nodes were unidentified in 20 (62.5%) of positive lymphoscintigraphy. In one patient we could not found any node, a woman 63 years old, with ductal carcinoma in situ. Other patients 97.6 % (40/41) lymph nodes were identified with three tracers.

From positive lymphoscintigraphy we identified 20/34 (58.8%) only one hot spot, 5/34 (14.7%) with 2 hot spot and 4/34 (11.3%) with 3 hot spots. Dynamic phase of lymphoscintigraphy were able to differentiate the first hot spot in 3 cases from 4 patients with 3 hot spots, also 3 cases with lymphatic lake in internal mammary area. In one case two hot spots that were found localized in axilla and internal mammary.

Lesion size and negative lymphoscintigraphy finding were summarized in table 3. In this table we compared lesion sizes and histopathologic results. Other histopathologic result is one case of lobular carcinoma. In 7/14 cases were ductal carcinoma in situ, and 4/6 (66.6%) ductal invasive cases were above fifty years.

Result of identification of sentinel node with 3 tracers was failed in one patient and 39/40 (97.5%) were identified and proved by histopathologic examination.

Table 3. Negative preoperative lymphoscintigraphy and histopathologic findings.

No of cases	DCIS (7/14)			Ductal Invasive (6/14			Others (1/14)		
Age	npbl	≤30 mm	>30 mm	npbl	≤30 mm	>30 mm	npbl	≤30 mm	>30 mm
≤50 yr	2	5	-	-	1	1	-	-	-
>50 yr	2	-	-	-	4	-	-	1	-

LYMPHOSCINTIGRAPHY IN MALIGNANT MELANOMA

Characteristic of malignant melanoma patients were summarized in table 4. One case with bulky mass in buccal area, 3 cases were post biopsy in retroauricular area, axillary and plantar area of the foot. One case was recurrence melanoma after 8 years in toenail area. Negative preoperative lymphoscintigraphy was found in one case, patient with post biopsy in axillary area but blue tract was visualized.

Table 4. Characteristic of Preoperative Lymphoscintigraphy findings in malignant melanoma in Dharmais Hospital (February 2001-March 2003)

Case Number	Positive Hot Spot Lymphoscintigraphy	Negative Lymphoscintigraphy	Clinical Staging	Histopathological Finding
1. KR/72 yr	Jugular chain	-	Submucosal Melanoma maligna Stage III	Positive
2. PT/63 yr	Jugular chain Supraclavicular nodes	-	Stage III	Positive
3. WL/48 yr	-	Negative	Lengtigo melanoma maligna Post biopsy axillary lymphnode ; malignant melanoma	Positive
4. ST/50 yr	Inguinal ipsilateral	-	Stage III	Positive
5. WD/50 yr	Inguinal ipsilateral Parailiac ipsilateral Paraaortic (hilus renalis)	-	Stage III	Positive

DISCUSSION

Method of lymphoscintigraphy examination were varied from injection e.g peritumoral, periareolar, intradermal and intratumoral also size of particles which were used range from 5 nm – 1000 nm. Mariani et al recommended that particles ranging from 100-200 nm would be represent the best compromise between the need for an efficient and fast lymphatic drainage.[1]

In our study we used only peritumoral injection for breast cancer patient and intradermal for malignant melanoma, also only one kind of nanocolloid with particle size approximately 100 nm. With this method we found that 70.8 % lymphoscintigraphy visualized hot spot at least one hot spot in breast cancer but in melanoma eventhough in late stage only one patient with negative lymphoscintigraphy.

Dynamic lymphoscintigraphy had been useful to identify the first echelon of sentinel node, we found that 9 patient with more than one hot spot, only one case with two hot spots visualized in the same time. Dynamic study frames also varied and investigators performed this phase in 10 to 20 minutes.[2]

Static study which was performed 2-4 hours after injection, was useful in post biopsy patients, and sentinel node in this patient could identified located near the site of biopsy. Different positions also help to overcome of superposition of primary tumor injection, in hanging breast position patients complained about the uncomfortable position and we were not do this position as routine procedure except we have difficulties with anterior and lateral positions.

Lymphoscintigraphy and histopathological finding were correlated and we found that lesion size less than 3 cm had 82.3% (28/34) positive lymphoscintigraphy. Non palpable lesion with positive lymphoscintigraphy was diagnosed as Paget's of the nipple and DCIS with nipple discharge.

Negative lymphoscintigraphy in our study was 29.2%, and during surgery sentinel node were identified with another tracer except one case, blue dye and gamma probe were negative. This case was a non palpable lesion and injection was guided with wire, intraparenchymally and histopathologic result was low grade DCIS. With three tracers, we identified 39/40 (97.5%) of sentinel nodes.Other investigators reported 98.4% with certain criteria.[3]

Lymphoscintigraphy in melanoma showed positive hot spot except one case with post biopsy in axillary area. During surgery blue patent injection visualized blue tract and blue node which was positive metastasis. One case with Clark IV melanoma lymphoscintigraphy was positive in non palpable inguinal node, and histopathologic result showed metastasis. Lymphoscintigraphy in melanoma showed a good result and many investigators reported with sentinel identification range 90-98 % also highlited with varies of pattern lymphatic spreading in trunk or head and neck.[4]

Pre operative lymphoscintigraphy is a complement in sentinel node procedure, the technique is simple and localizing sentinel node before surgery will give a better direction for surgeons to identify sentinel node intraoperatively.[5]

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