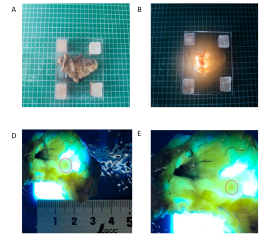


Protocol for Transillumination-Assisted Lymph Node Retrieval in Left-Sided Colorectal Cancer Specimens

DOI

<https://dx.doi.org/10.17504/protocols.io.e6nvw4yj2lmk/v1>



zhen zhang¹

¹Shanxi Province Cancer Hospital



zhen zhang

Shanxi Province Cancer Hospital

Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account



DOI: <https://dx.doi.org/10.17504/protocols.io.e6nvw4yj2lmk/v1>

Protocol Citation: zhen zhang . Protocol for Transillumination-Assisted Lymph Node Retrieval in Left-Sided Colorectal Cancer Specimens. protocols.io <https://dx.doi.org/10.17504/protocols.io.e6nvw4yj2lmk/v1>

License: This is an open access protocol distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Created: November 13, 2025

Last Modified: November 13, 2025

Protocol Integer ID: 232262

Keywords: Transillumination, Surgical pathology, Colorectal cancer, lymph node retrieval in colorectal cancer specimen, assisted lymph node retrieval in left, assisted lymph node retrieval, lymph node retrieval from mesenteric tissue, colorectal cancer specimen, lymph node retrieval, sided colorectal cancer specimens in routine pathological sampling, sided colorectal cancer specimen, lymph node, mesenteric injection of dye, colorectal cancer, sided colorectal cancer, lymph node yield, visible light, low lymph node yield, friendly transillumination device, dye, protocol for transillumination, properties of visible light, thin adipose tissue, transmitted light, mesenteric tissue

Abstract

In routine pathological sampling, it is common for left-sided colorectal cancer specimens to yield fewer than the 12 lymph nodes recommended by the NCCN guidelines, necessitating additional dissection. A low lymph node yield directly affects the accuracy of pathological staging and prognostic assessment. Over the past decades, various techniques have been developed and applied to improve lymph node retrieval in colorectal cancer specimens. However, most existing methods either involve toxic chemical reagents such as ether or xylene, or require mesenteric injection of dyes such as methylene blue or carbon particles. Although these techniques can significantly increase lymph node yield and have been adopted in some institutions, they are often complex, hazardous, time-consuming, and increase workload.

Based on the good light-transmitting properties of visible light in thin adipose tissue, we developed a simple and user-friendly **transillumination device** to assist in lymph node retrieval from mesenteric tissue. This device emits transmitted light that highlights lymph nodes embedded within adipose tissue, making them appear with distinct translucency compared to surrounding tissue, thereby facilitating rapid visual identification by pathologists. Compared with traditional palpation-based dissection, the use of this device significantly improves lymph node yield, enhances sampling efficiency, and reduces misidentification. We anticipate that wider adoption and further refinement of this technique will enhance its clinical applicability and value.

Attachments



[Protocol for Transil...](#)

1,022KB

Guidelines

- Carefully follow the described procedure for mesenteric tissue slicing, transillumination, and lymph node retrieval to ensure reproducibility.
- Handle all tissue specimens according to standard histopathological practices.

Materials

One high-transparency acrylic plate (3 mm thick, 10 × 10 cm² in size);
Four small wooden blocks (used as supporting stands);
One waterproof LED light (used as the transillumination source).



Safety warnings

- ❗ The LED light source provides a maximum brightness of 300 lumens. Avoid direct eye exposure to prevent discomfort or potential damage.

Ethics statement

- All tissue specimens used in this protocol were obtained with informed consent and under approval from the institutional ethics committee.
- Researchers must adhere to relevant local regulations regarding the handling of human tissue samples.

Before start

Confirm that the LED light source and acrylic platform are properly assembled and securely fixed before use.

Title

1 Protocol for Transillumination-Assisted Lymph Node Retrieval in Left-Sided Colorectal Cancer Specimens

Abstract

2 In routine pathological sampling, it is common for left-sided colorectal cancer specimens to yield fewer than the 12 lymph nodes recommended by the NCCN guidelines, necessitating additional dissection. A low lymph node yield directly affects the accuracy of pathological staging and prognostic assessment. Over the past decades, various techniques have been developed and applied to improve lymph node retrieval in colorectal cancer specimens. However, most existing methods either involve toxic chemical reagents such as ether or xylene, or require mesenteric injection of dyes such as methylene blue or carbon particles. Although these techniques can significantly increase lymph node yield and have been adopted in some institutions, they are often complex, hazardous, time-consuming, and increase workload. Based on the good light-transmitting properties of visible light in thin adipose tissue, we developed a simple and user-friendly **transillumination device** to assist in lymph node retrieval from mesenteric tissue. This device emits transmitted light that highlights lymph nodes embedded within adipose tissue, making them appear with distinct translucency compared to surrounding tissue, thereby facilitating rapid visual identification by pathologists. Compared with traditional palpation-based dissection, the use of this device significantly improves lymph node yield, enhances sampling efficiency, and reduces misidentification. We anticipate that wider adoption and further refinement of this technique will enhance its clinical applicability and value.

Materials

- 3 One high-transparency acrylic plate (3 mm thick, 10 × 10 cm² in size);
Four small wooden blocks (used as supporting stands);
One waterproof LED light (used as the transillumination source).

Procedure

- 4 **Assembly of the Transillumination Device**
Use a high-transparency acrylic plate as the sampling platform, supported by four wooden stands. Mount a small waterproof white LED light at the center of the platform. All components are fixed using waterproof adhesive. The assembled structure is shown in Figure 1.

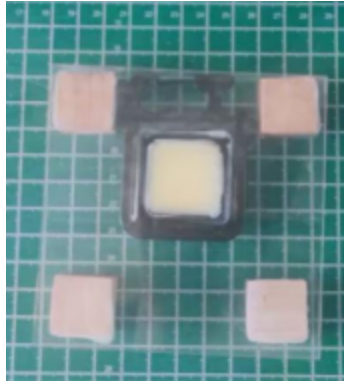


Figure 1. Photograph of the transillumination device. The acrylic plate (3 mm thick, 10 × 10 cm²) is supported by four wooden blocks, with a central waterproof LED light as the illumination source.

5 Mesenteric lymph node retrieval

Firstly, the mesenteric tissue is sliced into thin sections approximately 5–8 cm² in area and 3–5 mm in thickness (Figure 2A). Adjacent mesenteric tissue slices should be carefully examined to determine whether any lymph nodes have been bisected. If a lymph node is found to be divided into two parts, the fragments should be reassembled and placed together in the same embedding cassette, recorded as a single lymph node. Secondly, the remaining intact tissue slices are placed on the acrylic platform for lymph node detection under transillumination (Figure 2B–E). Under transmitted light, lymph nodes typically appear as slightly opaque, round, or oval nodular structures. These structures are further examined by gentle palpation to confirm their consistency. All confirmed or suspected lymph nodes are sampled and processed according to standard histopathological procedures.

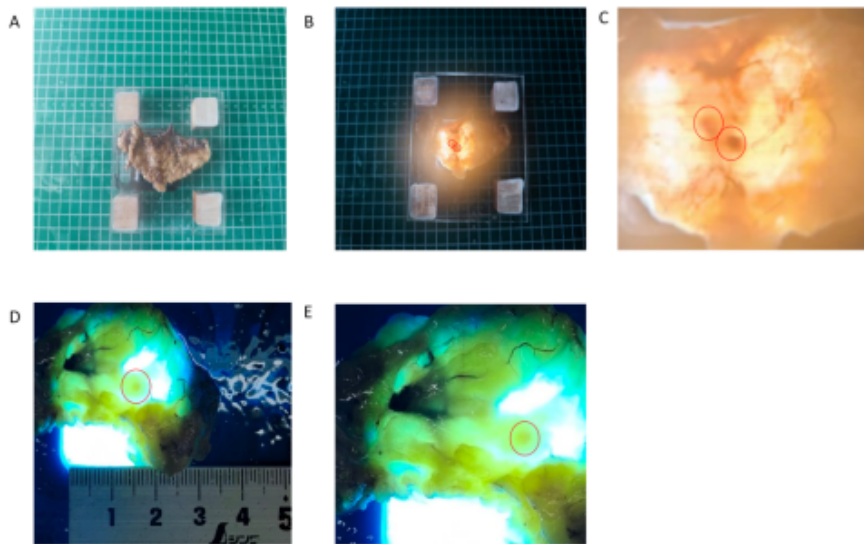


Figure 2. Photographs of the transillumination device under different lighting conditions. (A) Mesenteric tissue placed on the transillumination device with the light source turned off. (B) Transillumination with a colorless transparent acrylic plate showing differential tissue translucency. (C) Magnified view of the area indicated in (B). (D) Transillumination with a blue acrylic plate providing enhanced contrast for lymph node visualization. (E) Magnified view of the area indicated in (D). Red markings indicate the locations of suspected lymph nodes.

Notes

- 6 1、 The light source used in this device provides a maximum brightness of 300 lumens. However, prolonged exposure or direct viewing of the light may cause eye discomfort and should be avoided.
- 2、 Large blood vessels, clots, and hemorrhagic areas can significantly reduce light penetration. In regions with abundant vasculature, the mesenteric tissue thickness may be appropriately reduced to improve translucency.

Associated Publications

- 7 Zhang Z., et al. "Transillumination Improves Lymph Node Yield in Left-Sided Colorectal Cancer." accepted for publication in Scientific Reports.