

BRIEF COMMUNICATION**RETROPERITONEAL LYMPH NODAL VISUALIZATION USING 30% GUAJAZULEN BLUE (CHROMOLYMPHOGRAPHY)****R. Harzmann, P. Hirnle, M. Geppert**

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ABSTRACT

Guajazulen, a dark blue lipid-soluble dye was used to stain retroperitoneal lymph nodes before lymphadenectomy. Initially, a 30% solution of Guajazulen (Merck, Darmstadt, FRG) in iodinated oil (Lipiodol®; Byk-Gulden, Konstant, FRG) was injected endolymphatically in the hindlimbs of pigs (n=10) and dogs (n=8) to better visualize retroperitoneal lymph nodes. Because of encouraging results, 11 patients with testicular cancer undergoing staging or therapeutic laparotomy underwent endolymphatic injection of this dye solution preoperatively. The excellent staining of retroperitoneal lymph nodes facilitated nodal selectivity during lymphadenectomy.

Carcinomas of the bladder, prostate, testis, and kidney metastasize to regional lymph nodes. Retroperitoneal lymphadenectomy aims to extirpate lymph nodes containing cancer for staging and therapeutic purposes. It is imperative, however, during these extensive dissections to remove as little of adjacent tissue as possible because division of nearby sympathetic nerves and ganglia have adverse side-effects including retrograde ejaculation (1). To limit dissection and thereby

minimize these sequelae, retroperitoneal lymph nodes were stained preoperatively using endolymphatic dye injection.

MATERIALS AND METHODS

A 30% solution of Guajazulen, a dark blue dye highly soluble in Lipiodol® (an iodinated oil commonly used for direct lymphography) and previously found safe in tests of its mutagenicity and carcinogenicity, was prepared under sterile conditions (pharmacy of the University of Tübingen and initially tested in pigs (n=10) and dogs (n=8)). A lymphatic vessel of the hind shank was cannulated and 2ml of the dye solution was injected on each side. After the animal experimentation and after permission for clinical application given by the local ethics commission, the same Guajazulen-Lipiodol® solution was instilled in lower extremity lymphatics in 11 patients scheduled to undergo retroperitoneal lymphadenectomy for treatment of testicular cancer 1-3 days later.

RESULTS

In both experimental animals and patients, the intralymphatic injection of



Fig. 1. Dark-blue stained retroperitoneal pig lymph node after chromolymphography with 30% Guajazulen-Lipiodol® solution.

Guajazulen-Lipiodol® solution readily stained lymphatics dark blue which were readily visible through the skin. At subsequent laparotomy, retroperitoneal lymph nodes were also darkly blue-stained and were easily seen even through the intact peritoneum.

Dissection and removal of these blue-stained nodes were extremely simplified in contrast to the normal situation during lymphadenectomy (*Fig. 1*). No untoward complications were encountered either experimentally or clinically. In patients with massive lymph node involvement by metastatic disease ($n=3$), there was no staining of the tumor tissue. Otherwise, there was excellent staining in patients with micrometastases to retroperitoneal lymph nodes ($n=6$) and in patients without lymph node metastases ($n=2$ --staging lymphadenectomy). There was a direct correlation between staining of retroperitoneal lymph nodes with the preoperative conventional lymphogram and with the

final histopathology of the resected lymph nodes.

COMMENT

The preoperative endolymphatic injection of 30% Guajazulen-Lipiodol® solution facilitated retroperitoneal lymphadenectomy and minimized unnecessary dissection by darkly staining paraaortic nodes. Inclusion of the iodinated oil (Lipiodol®) in the infusate also permitted preoperative lymphographic assessment of retroperitoneal lymph nodes (i.e., conventional lymphography). This technique seems especially useful in patients with little or no metastatic involvement of regional lymph nodes but probably not in those with bulky nodal disease. Substances used previously for this purpose (2-4) have poor staining properties and/or were more injurious to lymph nodal bearing tissue.

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