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A method for identification of vertebral level

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Summary

A method of spinal level marking applicable particularly for use in thoracolumbar posterior spinal operations is described. The use of patent blue V dye in this procedure is discussed in a consecutive series of over 100 cases. No serious adverse effects were observed. The technique ensures accurate identification of spinal marking and helps to minimize anaesthetic time.

Introduction

Level identification during posterior operations on the spine can be troublesome. Various methods are currently employed, all of which have their disadvantages. In the Associated Unit of Neurosciences at Walton Hospital we have recently devised a simple technique which has proved to be of value for posterior operations on the dorsolumbar spine. It is particularly useful in the identification of thoracic levels, and lumbar levels with transitional vertebrae, and has become routine in lumbar microdiscectomy.

Method

On the morning of surgery the patient is taken to the X-ray department and placed on the screening table. Using an aseptic technique a 22 gauge needle is passed into the interspinous ligament (or ligamentum flavum for lumbar microdiscectomy) at the proposed level of surgery. With the needle *in situ* antero-posterior and lateral radiographs are taken to verify correct placement. A small quantity (1–2 ml) of undiluted patent blue V dye is then injected as the needle is gradually withdrawn. At operation the presence of a clearly visible column of dye in the interspinous ligament (or ligamentum flavum), combined with prior inspection of the radiographs with the needle *in situ*, clearly identifies the level. In lumbar microdiscectomy the accurate placement of the small incision needed can be gauged by reference to the point of skin insertion of the needle as shown on the films giving accurate access to the appropriate interlaminar space. In this respect, it is important that the marking should be performed with the patient in the same anatomical position which is subsequently employed at operation.

Discussion

None of the methods currently employed for level identification in posterior operations on the spine are entirely satisfactory. Preoperative skin marking techniques are unreliable as the skin may glide over underlying tissues. Techniques which rely on the recognition of anatomical landmarks, such as identification of the sacrum or of the upturned inferior margin of the lamina of L5, entail more surgical exposure than might otherwise be employed. Preoperative radiological examination requires that a trained radiographer be available in theatre, and also prolongs anaesthetic time. The technique herein described overcomes all these problems. Its benefit in lumbar microdiscectomy for accurate placement of the skin incision has been mentioned, and at operation for thoracic lesions the technique enables only the minimum necessary amount of bone to be removed by precise identification of vertebral level.

TABLE I *The use of patent blue V dye level marking in 103 patients undergoing operations on the dorsolumbar spine (Walton Hospital, January 1984—July 1985)*

Type of operation	*Patients n=103*
Lumbar microdiscectomy	66
Lumbar laminectomy or fenestration	29
Thoracic laminectomy	8

From January, 1984 to July, 1985 the technique has been used in over 100 patients undergoing a variety of procedures on the dorsolumbar spine (Table 1). No serious complications have been observed in relation to the use of patent blue V dye in this series of patients. However, in one patient a transient generalised pruritus lasting for 30 minutes was observed and although the symptom appeared to be resolving spontaneously a single dose of intravenous hydrocortisone was administered as a precautionary measure. A literature search has failed to identify any reports on the effects of intrathecal administration of the patent blue V dye, but intradural injection should be avoided because of potential side effects.

In the emergency situation, to mark the level of a radiographic block, the technique has been successfully employed without any adverse effect.

Patent blue V dye would appear to be non-toxic if used in the method we describe and has been passed for use as a food additive (E131) by the European Community and Ministry of Agriculture, Fisheries and Food. Since the dye is fairly rapidly cleared from the tissues and metabolised, and then excreted in the urine, the technique cannot reliably be performed except on the day of operation. We have found a period of up to 6–8 hours satisfactory.

In an extensive literature search no previous report of this technique has been found.

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