FROM THE ORTHOPAEDIC DEPARTMENT, UNIVERSITY OF UPPSALA, SWEDEN.
HEAD: PROFESSOR CARL HIRSCH

XYLOCAIN ANAESTHESIA IN LUMBAR MYELOGRAPHY WITH WATER SOLUBLE IODINE CONTRAST

By

CARL HIRSCH

In many earlier papers (Lindblom 1946 and 1948, F. Knutsson 1951, Friberg & Hult 1951, Hirsch 1958, B. Knutsson & Wiberg 1958) the water soluble iodine contrast myelography introduced by Arnell for visualization of the lumbar part of the subarachnoid space has been presented and discussed.

Occasionally the contrast media may cause cramps and undesirable convulsive reactions. Even if no serious complications do occur this has deterred many clinicians from using the method.

As Abrodil or contrast U is irritating when introduced into the subarachnoid space lumbar anaesthesia must be given before the contrast medium is injected. Three or four hours after the injection has taken place cramps may rarely occur. It has been said that these reactions may arise from the patient being sensitive to iodine. Skin tests performed before myelography have not offered protection against unexpected reactions. Some investigators have claimed that the lumbar puncture needle must be thin, otherwise spinal fluid may leak out and cause trouble. However, even with a very thin needle late cramps do appear.

During more than one year we have not observed any cramps and have had no trouble with our myelographic technique. It is used routinely almost every day as a diagnostic measure for all patients with sciatica. In 1958 it was undertaken 210 times. Some cases referred to us from other hospitals had already had one myelogram performed when we for some reason made another. The only thing that we changed in our technique was that for lumbar anaesthesia Xylocain was used. It is produced by the Swedish pharmaceutical company Astra. The nonproprietary names are lignocaine and lidocaine.

It is hard to explain why Xylocain offers more safety. It may be that the anaesthetic effect of Xylocain lasts longer and that the contrast medium during that time has a greater chance of disappearing from the subarachnoid space while the anaesthesia is still active. It is also possible that Xylocain has a lower failure rate as to its anaesthetic effect, and that it gives a safer anaesthesia. If our cases are analyzed with regard to the above mentioned reasons it can be stated that the differences in anaesthetic effectiveness are negligible and do not explain why cramps do not appear. It was not the badly anaesthetized patient that developed cramps when novocain was used and furthermore the duration of lumbar Xylocain anaesthesia does not last longer than other lumbar spinal anaesthesias.

In experiments on cats and monkeys Bernhard and Bohm in 1954 and 1955 studied the effects of different local anaesthetics on electrically evoked epileptiform cortical and corticospinal phenomena. The experiments showed that local anaesthetics had a specific anticonvulsive effect. Among the diferent local anaesthetics tested Xylocain showed a favourable relation between anticonvulsive effect and toxity, and doses which abolished the experimental epileptic attack were found to have no influence on the blood pressure. On the basis of these experiments Xylocain was used clinically as an anticonvulsant in cases of status epilepticus and it was found that intravenous injection of Xylocain stopped the convulsions.

The question now arises whether the favourable results observed in myelography when Xylocain has been used can be explained by anticonvulsive protection. That will depend on whether or not the doses used for lumbar anaesthesia can be said to be sufficient. For clinical cases Bohm et coll. injected intravenously about 10 ml. 2 % Xylocain solutions. For lumbar anesthesia we gave one of 1–1.5 ml. of 5 % solution. It seems acceptable to consider the concentration in the spinal fluid to be high enough for an anticonvulsive effect.

The other question that has to be answered is how soon Xylocain disappears from the spinal fluid after lumbar anaesthesia, that is to say if a concentration great enough to produce an anticonvulsive protection can be said to last long enough. Xylocain does not remain in the spinal fluid as far as quantitative analyses are concerned to such an extent that it is possible to claim that it can be active (Mörch, Rosenberg & Truant, 1957). On the other hand the metabolic phenomena involved in the disappearance of Xylocain are so far not well understood. It might well be that the response to convulsive reactions is

decreased over a period longer than can be correlated with the concentration of Xylocain in spinal fluid.

Thoracic surgeons (Wilson & Gordon 1952, Crawford 1953, Southworth & Dabbs 1953) have claimed that large doses of Xylocain have a marked influence on the central nervous system causing a sedative effect better than other local anaesthetics. Björn in 1956 in his experience from dental surgery confirmed that even moderate doses produced a favourable response. Gilbert et al. found in 1951 that Xylocain induces central analgesia to some extent, better than intravenously injected procaine. Gilbert used Xylocain in late stages of cancer. De Clive-Lowe et al. in 1958 claimed after several years of extensive clinical experience that intravenously administered Xylocain during general anaesthesia while operations were performed gave a prolonged postoperative analgesia, in 47 % of their cases lasting longer than 12 hours. This has been confirmed by Dawkins & Steel in 1957. Halldin in 1952 and 1954 noticed that a patient suffering from epilepsy which he treated for dental trouble had less attacks when Xylocain anaesthesia was given. It was Halldin's report that encouraged Bernhard and Bohm to start their investigations.

For the time being it might not be possible to give an explanation as to the favourable influence of Xylocain when used in lumbar anaesthesia before myelography is done. Our recent knowledge, however, seems to justify the assumption that Xylocain has a cramp-releasing and anticonvulsive effect and that even injected into the subarachnoid space it might be active. It is, however, a fact that since we started to use Xylocain no complications such as cramps and convulsive reactions have occurred.

SUMMARY

Lumbar myelography with water soluble iodine contrast has to be performed under lumbar spinal anaesthesia. Occasionally cramps and convulsive reactions may appear three to four hours after the examination is finished. These undesirable reactions have not occurred in a series of 210 cases since lumbar anaesthesia was given with 1—1.5 ml. 5 % Xylocain (lidocain).

RESUME

La myélographie lombaire avec contraste d'iodine soluble à l'eau doit être pratiquée sous anesthésie rachidienne lombaire. Occasionellement, des crampes et des réactions convulsives peuvent apparaître

trois ou quatre heures après l'examen. Ces résultats indésirables ne se sont pas manifestés dans une série de 210 cas depuis que l'anesthésie lombaire a été pratiquée au moyen de 1 à 1.5 ml. 5 % xylocaine (lidocaine).

ZUSAMMENFASSUNG

Die lumbale Myelographie mittels wasserlöslichem Jodkontrastmittel muss unter Spinalanästhesie ausgeführt werden. Gelegentlich können Krämpfe und Konvulsionen drei bis vier Stunden nach Beendigung der Untersuchung auftreten. Diese unerwünschten Reaktionen sind nicht mehr vorgekommen seitdem Lumbalanästhesie mit 1–1,5 Ml 5 % Xylocaïn (Lidocaïn) in einer Reihe von 210 Fällen angewendet wurde.

LITERATURE

Ablett, J. J. L., Dawkins, C. J. M. & Steel, G. C.: Extradural block with Xylocaine. Anaesthesia, July 1951.

Arnell, S.: Myelography with watersoluble contrast. Acta Radiologica suppl. 75, 1948.

Bernhard, C. G. & Bohm, E.: On the effects of Xylocain on the central nervous system with special reference to its influence on epileptic phenomena. Experientia X/11: 474, 1954.

– – The action of local anaesthetics on experimental epilepsy in cats and monkeys. Brjt. J. Pharmacol. & Chemotherapy 10: 288, 1955.

Bernhard, C. G., Bohm, E. & Höjeberg, S.: A new treatment of status epilepticus. A. M. A. Archives of Neurology and Psychiatry 74: 208, 1955.

Bernhard, C. G., Bohm, E., Höjeberg, S. & Melin, K. A.: The effect of intravenous Xylocain on the cortical seizure activity evoked by intermittent photic stimulation in epileptics. Acta Psychiatr. & Neurol. Scand. 31: 185, 1956.

Bernhard, C. G., Bohm, E., Höjeberg, S. & Wiesel, T.: Epilepsibehandling. 4. Om lokalanestetikas inverkan på epileptiska anfall. Sv. Läkart. 53: 2188, 1956.

Björn, H.: A survey of recently introduced drugs for local anaesthesia. Odontologisk Revy 7: 3, 1956.

Bohm, E.: Behandling av status epilepticus med intravenösa Xylocaininjektioner. Nord. Med. 59: 545, 1958.

de Clive-Lowe, S. G., Desmond, J. & North, J.: Intravenous lignocaine anaesthesia. Anaesthesia 13: 138, 1958.

Crawford, O. B.: Comparative qualities of three new local anesthetic drugs: Xylocaine, Cyclaine, and Pravocaine. Anesthesiology 14: 278, 1953.

Dawkins, C. J. M. & Steel, G. C.: Intramuscular lignocaine. Anaesthesia 12: 426, 1957.

Friberg, S. & Hult, L.: Comparative study of abrodil myelogram and operative findings in low back pain and sciatica. Acta Orthop. Scand. 20, 1951.

Gilbert, C. R. H., Hanson, I. R., Brown, A. B. & Hingson, R. A.: Intravenous use of Xylocaine. Current Researches in Anesth. & Analg. 30: 6, 301, 1951.

Halldin, T.: Gynnsam inverkan av Xylocain vid ett fall av epilepsi. Sv. Läkart. 51: 2147, 1954.

Hirsch, C.: The clinical evaluation of sciatica. Acta Orthop. Scand. 27: 210, 1958.

Knutsson, B. & Wiberg, G. On surgically treated herniated intervertebral discs. Acta Orthop. Scand. 28: 108, 1958.

Knutsson, F.: Lumbar myelography with water-soluble contrast in cases of disc prolapse. Acta Orthop. Scand. 20, 1951.

Lindblom, K.: Lumbar myelography by abrodil. Acta Radiologica 27, 1946.

– The subarachnoid spaces of the root sheats in the lumbar region. Acta Radiologica 30, 1948.

Mörch, E. T., Rosenberg, M. K.. & Truant, A. T.: Lidocaine for spinal anaesthesia. Acta anaesth. Scand. 1: 105, 1957.

Ottosson, J. O.: The effect of Xylocaine in electric convulsive treatment. Experientia 11: 453, 1955.

Southworth, J. L. & Dabbs, C. H.: Xylocaine: A superior agent for conduction anaesthesia. Current Researches in Anesth. & Analg. 32: 159, 1953.

Wiedling, S.: Xylocain. Ein intressantes Lokalanaesthiticum. Der Anaesthesist 1: 119, 1952.

Wilson, H. B. & Gordon, H. E.: Xylocaine. A local analgesic agent for Thoracoplasty. Anaesthesia 7: 157, 1952.