

NEUROLOGICAL COMPLICATIONS FOLLOWING MYELOGRAPHY WITH WATER-SOLUBLE CONTRAST MEDIUM

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The first to describe the use of a water-soluble contrast medium for myelography were *Arnell* and *Lidström* (1931). They used Abrodil 20 % and apparently without any serious complications. However, the presence of this hypertonic solution alone in the spinal canal is painful and can cause shock or spasm, for which reason the examination must be performed under spinal anaesthesia (*Arnell*, *Lindblom*, *Lindgren*, *Nordentoft*, and others). Abrodil was not widely used until the nineteen-forties.

On the basis of questionnaires filled out by radiologists in Sweden *Lindblom* (1945) reported that complications had occurred in 54 of a total of 721 patients following myelography with different kinds of water-soluble contrast media. These side effects were: headache, neck-stiffness, shock and lumbar pain. Spasms of the legs occurred in 2 cases and pareses of the legs and bladder and rectal disturbances in 3. In all of these 5 patients the examination had not been performed with Abrodil 20 % but with Per-abrodil 35 % or Intron 40 %. Fatal complications following accidental intradural injection of Per-abrodil are also on record (*Johansson*, 1943, *Karlén*, 1942, *Hyosleff*, 1948).

No neurologic side effects of myelography with Abrodil 20 % have been reported in the literature. In 1955 *Reinhardt* and *Panter* thus wrote: "Nochmals muss mit allem Nachdruck betont werden, dass die Abrodilmyelographie keine neurologischen oder sonstigen Dauerschäden hinterlässt, wovon wir uns durch Nachbeobachtungen der untersuchten Patienten überzeugen konnten".

During the last 6 years myelography with Abrodil has been performed on about 760 occasions at the Malmö General Hospital with serious complications in 3 cases. These cases are reported in brief below.

Technique:—After premedication with 0.5 ml. morphine-scopolamine the patient is placed on the side to be examined with the head end of the examination table raised, and 1 ml. of ephedrine is given subcutaneously. Spinal anaesthesia is induced with 2 ml. of Inj. percaini grave, after which 10 ml. of Abrodil (Kontrast U 20 % "Leo") is slowly injected. Lateral, oblique and postero-anterior films are taken with the patient in the lateral, semi-prone and prone positions. After the examination the patient is kept for 8 hours in bed with the head end raised.

CASE REPORTS

Case 1. N. J. A man, aged 43, was admitted because of assumed intervertebral disc protrusion. He had pain radiating down the left leg to the outer border of the foot and a weak achilles tendon reflex. Myelography was followed by decreased sensibility of the left leg, of the inner surface of the right thigh, perineum, and genital organs and by incontinence of the faeces and urine and sexual impotence. The myelogram showed no signs of a pathologic condition. The patient was not operated upon. Periodic treatment with vitamin B₁₂ had a favourable effect. All of the symptoms gradually disappeared except the diminished sensibility of the perineum which was still persistent when the patient was last seen 2 years later.

Case 2. S. F. A man, aged 39, was admitted because of suspected intervertebral disc protrusion. He had pain radiating down to the lateral and anterior surface of the left thigh, and anterior aspect of the lower leg but not the foot. There was decreased sensibility in the L IV dermatome. Atrophy of the quadriceps and weakened patellary reflex were noted. The myelogram showed no disc protrusion. The following day the patient reported that he could not pass water or stools. He had anaesthesia of the inner surfaces of both thighs, the perineum, penis and scrotum and anal region. Surgical exploration failed to reveal any disc protrusion. Subsequent periodic treatment with vitamin B₁₂ produced some improvement. When the patient was last seen 10 months after the operation he still had moderate bladder and rectal symptoms and he was still impotent.

Case 3. E. K. A man, aged 53, had suffered from sciatica in 1945, 1951, and 1955. He was admitted to hospital in the spring of 1956 because of suspected intervertebral disc protrusion. He had pain radiating down into the right foot, decreased sensibility and weakness of the foot. On administration of contrast medium for myelography the patient complained of such pain after he had received only a few milliliters that it was decided to interrupt the injection. The films were therefore less informative, but were suggestive of an expansive process. This examination was not followed by any further complications. Continued conservative treatment produced no improvement and the patient was re-admitted in Oct. 1957. The neurologic findings were roughly the same as before. Myelography was repeated, this time the injection was not painful. The myelograms revealed the same changes as on the previous occasion but permitted no definite diagnosis. Myelography was followed

by paresis of the bladder and severe constipation as well as by anaesthesia of the inner surface of the thighs and of the genital and anal region. In view of the appearance of the myelogram and the complications the patient was referred to the department of neurosurgery, Lund, where he was operated upon in Nov. 1957. The following data were courteously placed at our disposal. The spinous process of the second, third and fourth lumbar vertebrae and the posterior arches of the third and fourth lumbar vertebrae were excised. No signs of an extradural tumour were observed. The dura was incised without interfering with the arachnoid. Pulsations were normal. All of the fibres of the cauda were packed together, swollen and grey brown. Passage of a soft catheter was arrested higher up. The posterior arch of the second lumbar vertebra was therefore excised. On incision of the dura the arrest was found to have been due to arachnoidal adhesions. Thus, nowhere in the region explored was any evidence seen of extradural or intradural expanding process. Arachnitis or radiculitis was assumed.—The patient was transferred back to the orthopaedic department, Malmö General Hospital, where he is still being cared for (March 1958). He still has bladder paresis and defaecation is difficult. The loss of sensibility is now less pronounced and involves only the perineum and the inner surface of the thighs.

In the 3 above mentioned cases serious neurological complications followed myelography. The question then arises whether these complications might have been due to the contrast medium as such, to hypersensitivity or to incomplete anaesthesia (epidural deposition) or to the actual spinal anaesthesia. As to complications after spinal anaesthesia *per se* Arner (1952) observed a transient local impairment of sensation in the skin around the anus as the only complication in but 1 case out of 2507 reviewed.

Independently of the actual cause of these complications following myelography, the latter are rare (0.4 % of 760 cases).

Since myelography is so valuable in the exact diagnosis of disc protrusion when surgery is indicated and since Abrodil is the best contrast medium available for this purpose, this method seems to be indicated independent of the risk of rare complications.

S U M M A R Y

A fairly thorough search of the literature failed to reveal reports of any serious effects of myelography with Abrodil 20 %.

During the last 6 years about 760 myelographies were performed with Abrodil at the Malmö General Hospital. Three (0.4 %) of the examinations were followed by neurological complications.

These complications were obstinate and regressed but slowly. Symptoms of varying severity still persist. (Follow-up $\frac{1}{2}$ –2 years).

Case reports are given.

R E S U M E

Malgré des recherches relativement approfondies dans la littérature, il n'a pas été possible de trouver le compte rendu d'effets graves de la myélographie avec Abrodil 20 %.

Au cours des derniers six ans, environ 760 myélographies ont été pratiquées avec Abrodil à l'hôpital général de Malmö. Trois (0,4 %) examens ont été suivis de complications neurologiques.

Ces complications ont été persistantes et n'ont disparu que lentement. Des symptômes d'une gravité variable continuent à persister. Les cas ont été suivis entre 6 mois et 2 ans.

Il est rendu compte de ces cas.

Z U S A M M E N F A S S U N G

Eine eingehende Nachforschung in der Litteratur brachte keinerlei Berichte über ernstliche Folgen der Verwendung von 20 % Abrodil in der Myelographie ans Tageslicht.

Während der letzten 6 Jahre wurden ungefähr 760 Myelographien mit Abrodil am Allgemeinen Krankenhaus in Malmö ausgeführt. Drei (0,4 %) der Untersuchungen waren von neurologischen Komplikationen gefolgt.

Diese Komplikationen waren hartnäckig und gingen nur langsam zurück. Symptome von verschiedengradiger Schwere sind noch immer vorhanden (Nachuntersuchung $\frac{1}{2}$ –2 Jahre).

Krankengeschichten werden gegeben.

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