

ABSTRACTS

Editorial Comment: Material for this section is not abstracted in a uniform style. Many employ direct quotations only. Others are written in the more conventional form. At times there may be included a few opinions, personal to the abstractor, which, where they appear will be bracketed or labeled "Comment." The Editorial Office continues in its desire to receive correspondence from readers relative to the management of this section.

GREADY, T. G., JR.: *Some Complications of Caudal Anesthesia and Their Management.* J. A. M. A. 123: 671-675 (Nov. 13) 1943.

"In a series of 121 cases of caudal anesthesia at the Chicago Lying-in Hospital there have been no deaths, either maternal or fetal. However, some interesting reactions have occurred, the most frequent being a drop in blood pressure. Our incidence of failures is 16 per cent. . . . Most serious and dangerous of the complications is that of injecting the solution into the subarachnoid space, and it has only been recently that precautions other than simple aspirations have been taken to prevent this accident. While no deaths have been reported due to this complication since the introduction of continuous caudal anesthesia, there have been serious accidents. . . . My associates and I have observed perforation of the dura once in our series of 110 cases. . . . According to the routine advocated by Hingson and Edwards and Gready and Hesselstine a test dose of 8 cc. of a 1.5 per cent solution of metycaine hydrochloride (120 mg.) was injected and ten minutes allowed to elapse. (The importance of this simple precaution cannot be too strongly emphasized.) At the end of ten minutes the patient had almost complete paralysis of the dependent extremity but was still able to move the toes on the opposite foot. In another two minutes there was complete

motor paralysis of both lower extremities, while on the abdomen the anesthesia had risen to the level of the third thoracic segment. Since no spinal fluid was obtained by aspiration it is apparent that had the precautionary measures of waiting ten minutes before injecting the 30 cc. dose not been taken the procedure would have resulted in massive spinal anesthesia (approximately 450 mg. in 30 cc.) which probably would have been fatal.

"Because its appearance is usually delayed, infection is sometimes overlooked as a complication of caudal block. It ranks second in importance to massive spinal anesthesia. . . . The principal etiologic factor in this type of case is obviously faulty technic. Extreme care should be taken in the sterilization of the apparatus and in the preparation of the solution. The site for injection normally is not the cleanest part of the body, situated as it is close to the anus. It should be as thoroughly cleaned and prepared as for any major surgical procedure. Rigid asepsis is of the utmost importance. If the needle technic is used, the only bacteriologic weak point in the equipment once the tubing is connected is the plunger of the syringe. Since the anesthesia is sometimes carried out over a period of hours, it is not at all improbable that during one of the many injections the plunger may be accidentally contaminated and then, on a sub-

quent injection, bacteria may be introduced into the sacral canal. . . . Local infection about the site of injection does not present such a problem as infection in the epidural space. There the management is the same as for other superficial infections. In our series so far we have had no infection of the epidural space nor have we had any local infection of the skin. . . . Intravenous injection of the drug is another complication which cannot always be avoided. . . . We have had 1 case in which this complication occurred. . . . This reaction lasted about two minutes and disappeared spontaneously before treatment could be instituted. . . . Treatment for the condition is more or less specific and is the same as that for an overdose of the drug. . . . It is imperative that respiration be maintained, by artificial means if necessary. One of the quick acting barbiturates, such as evipal sodium or pentothal sodium, should relieve the convulsions immediately. When caudal anesthesia is used, it is wise to have one of these drugs readily available. . . . Since the barbiturates counteract the untoward effects of the local anesthetic, the administration of one of them is indicated as preoperative medication when this type of anesthesia is to be used. Rapid absorption may be delayed by the addition of epinephrine to the solution. . . .

"Sensitivity to locally employed anesthetic drugs may occur, one of the most dangerous types being that manifested in the anaphylactic reaction. . . . If a reaction occurs, its management should be the same as for any other anaphylactic reaction, namely the immediate hypodermic administration of epinephrine hydrochloride. Convulsions, should they occur, are controlled by using barbiturates intravenously, care being taken not to give an overdose. . . . Judging from the paucity of reports in the literature, injury of the

nerve roots in the caudal canal does not often occur. . . . The complication of a broken needle has not yet occurred in our series, although of necessity we have used some needles more than five times. . . . A broken needle should be removed immediately lest it migrate farther into the sacral canal and become inaccessible. . . . The incidence of this complication has been considerably reduced since the development of the malleable needle and catheter technique. . . . Mild and severe vasomotor reactions developed more often than has been reported by most investigators. . . . In our group of cases there were 27 with a drop of more than 20 mm in systolic pressure. . . . All the larger changes in blood pressure occurred in patients in whom the level of anesthesia was at or above the umbilicus. . . . Every one of these patients responded to ephedrine sulfate administered hypodermically and oxygen inhalations. . . . Control of dosage should prevent too high a level of anesthesia should eliminate this reaction in most patients during labor. . . . Owing to variation in the type of sacrum and in angulation of the coccyx it is possible in difficult cases to penetrate the sacrococcygeal joint or the tissue lateral to it so that the point of the needle comes to rest on the anterior surface of the sacrum close to the rectum. This has occurred twice in our series. . . . The accident occurs more frequently with beginners and in most instances represents carelessness. . . . The advantage of the catheter technic aside from the fact that it allows greater freedom of movement on the part of the patient is that there is less danger of perforation of the dura or a blood vessel once the needle is withdrawn over the catheter. Three disadvantages are apparent: (1) There is more trauma associated with the introduction of the large gauge needle; (2) this trauma naturally increases the risk of infection; (3) the

number of failures should be increased, owing to the difficulties involved in the insertion of the large needle in some patients. With use of the needle technique the complications which are increased in number are (1) the perforation of the dural sac after the needle is in place with subsequent intraspinal injection, (2) the broken needle and (3) the possible trauma inside the canal if the needle is manipulated by the patient moving about on her back.

"In general, we have noticed some difficulty in maintaining the effect of the anesthetic that is used over a long period of time. . . . The thought has occurred to us that possibly the nerve roots may become refractory to the action of the drug after prolonged anesthesia. We have noticed this phenomenon in 3 cases in which we felt certain that the needle had not become dislodged from its proper place in the caudal canal." 28 references.

J. C. M. C.

DIDDLE, A. W., AND HILL, A. M.: *Pulmonary Embolism during Continuous Caudal Anesthesia: Report of a Maternal Death*. West. J. Surg., Obst. & Gynec. 51: 427-431 (Nov.) 1943.

"The potential dangers of continuous caudal anesthesia in obstetrics have been emphasized by most authors employing the procedure. . . . It is believed this protocol represents the first maternal death which may be attributed indirectly to the method with the production of a pulmonary infarct. . . . Mrs. (No. D-333) was a married, 22 year old, white housewife. . . . Physical examination at the first visit . . . revealed a healthy appearing, well developed, young woman. . . . Progress of the pregnancy was satisfactory. . . . August 3, 1943, at 2:00 P.M. labor began. . . . A blunt, bevel-pointed B-D

spinal needle size 15 G made by Becton, Dickinson and Company was inserted in the midline into the sacral hiatus using a guide needle in the manner described by Adams, et al. . . . Forty cubic centimeters of one per cent procaine in physiological saline was administered slowly over a 15 minute period. During the procedure clear solution was returned into the syringe. Subjective relief from pain, loss of anal sphincter tone, relaxation of the vaginal outlet, and diminution of sensation to pin prick to within two inches of the umbilicus was obtained within 25 minutes. This amount of anesthesia, which was considered 'comfortable' by the patient, was maintained.

"Complete dilatation of the cervix was present by 11:15 P.M. After two and one-half hour second stage of labor, preparation was made to do a classical application of Kielland forceps for a transverse arrest (ROT). . . . There was not sufficient relaxation of the uterus to permit manipulation of the anterior forcep blade. Therefore, it was decided to give open drop ether long enough to complete this procedure. . . . As the maneuver was coming to a close the patient suddenly 'caught' her breath. The anesthetic mask was removed. Observations at the moment included: the lips and skin were normal color, the pupils corresponded in size to the upper level of the surgical stage. . . . One deep respiratory gasp was followed by several shallow movements. Cyanosis appeared with moderate speed. Artificial respiration was begun and continued until forced respiration with oxygen could be instituted. Near the terminal stages coffee ground vomitus was raised. When the mother's survival seemed improbable, forceps extraction of the baby was done with moderate difficulty. . . . A nonviable term size infant was obtained.