

of sphincter of the anus and he was sure that all meningoceles were not the same. There were high types, middle types and low types.

*Chantraine, A.*, said that even if they had different heights, in the study he had made in New York with other colleagues in 53 patients, he had never found spastic sphincters, they usually were very flat. They found fibrillation, fasciculation or sometimes a patient who preserved a very good conus medullaris in a very small lesion, they found a good automatic response of the sphincter, but they never found any spastic response.

*Michaelis, L.* (England), said one seemed now to accept that the Briker bladder was a permissible operation. He thought that it was not. The few experiences at Stoke Mandeville with it were unsatisfactory. One patient died, another had to have two laparotomies for ileus caused by adhesions having formed after this operation. So, one should consider very carefully what would happen later. Dr. Cibeira, for local reasons, had great difficulties in getting his children at a much earlier age, and once he was able to do so he might not have had to consider this dangerous and mutilating operation at all. He asked whether it would not be better in such rare cases to transplant the lower ends of the ureters into the abdominal wall. This operation, which leaves the peritoneum and the bowel alone, was certainly much safer and just as effective as the ileal bladder.

*Cosbie Ross, J.*, reminded Dr. Michaelis that the word diversion of the urine included the operation which he had just accepted—in other words the ureterostomy.

*Guttmann, L.*, agreed with Mr. Cosbie Ross that one had indeed to be very selective in one's choice which kind of diversion one was going to use. As far as he could see from the literature, the ileal bladder seemed to be more successful in children than in adults, but Dr. Michaelis was right to draw attention to the dangers of the ileal bladder and he thought it was terrible if a patient came back with an ileus and was operated sometimes too late and had to die.

*Walsh, J.* (England), thought the Lapidus vesicostomy was preferable, from a long-term point of view, to an ileal loop, because the time would come when the patient was admitted as an emergency. One would wonder whether he had a pyelonephrosis or an obstructed ureter and one would be unable to investigate it properly with an ileal loop bladder.

*Cibeira, J.*, said with a small bladder he preferred the type of operation mentioned by Dr. Michaelis, but cystostomy had its indications. It was better to do the cystostomy, but if one had a big hydronephrosis and a very small trabeculated bladder, it was very difficult to do a cystostomy.

## PHENOL SPINAL BLOCKS

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(Paper presented by Dr. SOTELANO)

THE authors report their experience on the treatment of severe spasticity with the use of intrathecal phenol blocks.

A short review of surgical and non-surgical procedures is given, and spasticity is evaluated with regard to its influence upon urinary tract function and its interference with A.D.L.

Details of 15 cases are given about the level of lesion, an etiology, type of spasticity, type of bladder, interference of free circulation of C.S.F., and the results of unilateral or bilateral spinal blocks.

Indications: (a) Severe spasticity in both lower limbs, abdominal and trunk muscles, without contractures of the soft tissues. Marked hypertonicity may develop a mass flexion reflex syndrome, or an extensor pattern and sometimes flexor and extensor spasms may alternate. (b) Contractures of the soft tissues combined with spasticity. The latter must be abolished before deformities are operated. (c) Previous to bed-sore treatment, if spasticity is considered to be responsible for failure of plastic surgery, due to traction upon flaps. (d) Spasticity of the pelvic floor, external sphincter, or a hypertonic bladder.

A very careful evaluation of the patient is done before choosing the method to be used.

The blocking technique is described, and the use of a phenol solution in glycerol at different concentrations is stated.

## RESULTS

In general, spasticity as well as reflexes disappeared immediately on the same side where phenol was injected. On the opposite side, both of them diminished to a certain degree. Sometimes during half-hour of waiting, they progressively reappeared and a reinjection of 1 or 2 cc. was necessary.

In other cases hypertonicity and reflexes returned later and a new block had to be repeated some days later.

A group of patients were catheter free before the block as their bladders had already been automatic. Some of them developed immediate urine retention, and an indwelling catheter had to be inserted for some time. Others did not present any disturbance of micturition. In another group evaluation of micturition was not possible because they did not have reflex bladders, but contracted bladder due to infection.

Some patients with bilateral block were immediately rendered flaccid, others showed a remaining degree of spasticity which did not interfere with A.D.L. In cases of unilateral block, the final state of the opposite side was considered good enough.

In a few cases there was immediate failure, and repeated blocks again resulted in failure; these cases were considered to be related to free circulation of C.S.F.

## Discussion

*Ascoli, R.*, said he had no great experience with intrathecal phenol treatment but had greater experience with intrathecal alcohol treatment. He thought that the two methods were almost the same as far as results were concerned. He called attention to the fact that immediately after the injection there was complete paralysis of the bladder and he put in a permanent catheter for two or three weeks. The detrusor muscle was completely or partially paralysed, but the sphincter mechanism was also paralysed. As a consequence of this, one could have, with very little soft pressure on the abdomen, a very strong and very easy micturition. Patients were very enthusiastic about this. Naturally, the effect of intrathecal injection was provisional. He examined after several months the cystometric reaction of these patients after phenol or alcohol block and had seen that after a year or more one got contraction following electrical stimulation or distension of the bladder.

*Harris, P.*, asked the speaker what the vehicle was that the phenol was used with, and also if, as he understood, he did inject up to 4 cc. at one session. Also he wondered if one could have some information of the number of patients who had sparing of the sacral S2 and 3 roots on each side. Finally he wondered about subsequent arachnoiditis using

this technique in relation to progression of the lesion from the point of view of reflex function and the difficulty in obtaining success with further injections.

*Sotelano, F. H.*, said they had 18 cases and had had no problem with arachnoiditis following the injections. It did not increase the lesion.

*Guttmann, L.*, said he would like to repeat what he had said about phenol and alcohol blocks on former occasions. They should not be performed if there was a good functioning automatic bladder and he considered these injections of either phenol or alcohol as contra-indicated, having regard to the importance of the bladder function whether voluntary or automatic. He agreed entirely with Professor Ascoli that after alcohol block injection some automatic function of the bladder might occur, but this varied from case to case. In those cases where it did not occur one got a good autonomous bladder which could be emptied by abdominal pressure or by manual pressure. If Dr. Sotelano had so far had no difficulties after phenol he was very lucky. Patients admitted to Stoke Mandeville from neurological departments, where a phenol block had been done and where in the notes was written 'the bladder function has returned', had nevertheless arrived with greatly disturbed bladder functions and nasty infection. One must make conclusions from facts. The first publications on phenol block were somewhat misleading and people doing them took the resulting dysfunction of the bladder too lightly.

*Sotelano, F. H.*, said he did a spinal block in a very spastic type of bladder.

*Guttmann, L.*, asked whether the phenol block was done in incomplete or only in complete lesions.

*Sotelano, F. H.*, replied that it was done in complete lesions without any sensation.

*Harris, P.*, repeated his question regarding the vehicle used and the maximum amount used for injection.

*Sotelano, F. T.*, replied that the vehicle used was glycerine and 4 cc. were injected.

*Guttmann, L.*, commenting on Mr. Harris's question about arachnoiditis, said as far as alcohol block was concerned there was no question whatsoever that alcohol injection produced marked arachnoiditis. Actually any chemical must produce a more or less severe arachnoiditis. This was a quite established fact proved by pathologists.

*Harris, P.*, asked what percentage of patients had sparing with this technique of the sacral roots.

*Kerr, W. G.*, said that the whole argument between the advantage of phenol as opposed to alcohol was that one was supposed to be able to localise the phenol to the lumbar roots. Mr. Harris was asking whether, in an endeavour to get it into the lumbar roots, it also affected the sacral roots.

*Guttmann, L.*, said that what Dr. Sotelano wanted to eliminate was the profound spasticity of the bladder and this was indeed an indication in itself. The question Mr. Harris and Mr. Kerr were asking was whether one could do this selectively to lumbar roots with phenol. In theory this seemed all right but he doubted very much whether it was possible in practice.

*Weiss, M.* (Poland), said they had tried phenol injections in 20 cases but his results were not as satisfactory as had been presented here. He had found that in half of his material in cases where there was an automatic bladder there was loss of this automaticity. For this reason he no longer used phenolisation.

*Jochheim, K. A.* (Germany), asked in how many cases did the spasticity recover after phenol block.

*Sotelano, F. H.*, said in one case only was the result bad (the spasticity returned). In their institute, they combined the phenol block with tenotomy and myotomy. In three years' experience with tenotomy, the results in general were good. They tried to do this to see in these 18 patients if one could really do something and later on do a tenotomy or myotomy if there was some contracture of the tendons.

*Ascoli, R.*, said that as a urologist he placed great importance on the vesical function. But he must say that in cases where there was a very severe spasticity of the limbs where the patient was completely contracted and he was like an animal the loss of the vesical

function was of lesser importance. It was much more important that the patient had his legs in the correct position. With regard to the bladder, he would have a permanent catheter.

*Hingorani, K.* (England), asked the speaker (1) how far could he successfully localise the effect of phenol block to a certain nerve root without the danger of the substance spreading to involve other nerve roots and (2) what was the duration of the effect of phenol block in terms of time with regard to spasticity.

*Sotelo, F. H.*, replied (1) that the patient was rotated  $45^\circ$  and then the injection was done. It was not known exactly in what group they would put the phenol, but he did not care very much because they had a spastic patient with a spastic bladder and must relieve this; whether L3, 4, 5, it did not matter. (2) The duration of the effect was one year.

## PHLEBO-THROMBOSIS AND PULMONARY EMBOLISM IN PARAPLEGIA

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**Clinical Aspects.** The material for this paper consists of 500 traumatic paraplegics and tetraplegics admitted to the National Spinal Injuries Centre within fourteen days of injury.

An attempt was made to relate the incidence of phlebo-thrombosis and pulmonary embolism to a number of factors including age, sex, level and type of lesion, associated injuries, early operation and blood transfusion, and to assess the value of daily passive movements in the lower limbs in preventing phlebo-thrombosis.

In addition, an analysis was made derived from post-mortem material from this series.

The overall incidence of phlebo-thrombosis and/or pulmonary embolism was found to be 66 cases (13.2 per cent.), of which 15 (3 per cent.) were fatal.

The striking relationships established were (1) a higher incidence in complete lesions (16.5 per cent.) as compared with incomplete lesions (9 per cent.); (2) a high incidence in complete thoracic lesions (19.1 per cent.); and (3) a very high incidence in one particular year (25.3 per cent.). The value of twice-daily passive movement of the lower limbs for 10 minutes during the first six weeks after injury was not apparent. The question of prophylactic anticoagulant therapy is discussed.

**Pathological Aspect.** Fifteen out of 31 cases of traumatic paraplegia who died from causes related to the paraplegia (group 1) showed massive pulmonary embolism as the primary cause of death. Fatal pulmonary embolism occurred at any time from 4 to 85 days following the onset of paraplegia. There appeared to be a relationship between the presence of urinary infection and pelvic vein thrombosis.

## Discussion

*Dollfus, P.*, asked two questions: (1) Had they given up completely at Stoke Mandeville putting blood transfusions in the lower limbs? (2) Had patients who were treated