

Letters to the Editor

Lumbar Myelography Followed by Meningitis

To the Editor:

A 47-year-old man underwent lumbar myelography for hernia complaints. The procedure itself was uneventful. About ten hours later, he developed the clinical picture of bacterial meningitis. Gram stain of his cerebrospinal fluid showed an abundance of granulophile leucocytes but no bacteria. The next day, no growth was visible on solid media, but various streptococci were cultured from the broth on the cerebrospinal fluid sediment. Therapy was started with flucloxacillin, rifampin, and cefotaxim given intravenously; when the streptococci were found to be sensitive to penicillin G, this antibiotic, given intravenously, led to complete recovery.

Twelve other myelographies were carried out without incident by different doctors, including the neurologist who punctured the former patient. One week later, the same neurologist performed lumbar myelography on a 68-year-old woman with lower hernia complaints. The following day, she too showed clinical acute bacterial meningitis. The gram stain of her cerebrospinal fluid also was full of granulophile leucocytes. No bacteria were seen. Initial therapy was with intravenous flucloxacillin, cefotaxim, and penicillin G. Again, various streptococci were cultured, now directly on solid media, sensitive to penicillin G.

TRACING AND OBSERVATION

Immediately after the first iatrogenic meningitis, the roentgen contrasting fluid in question was taken out of use, as it was suspected to be contaminated. After the second accident, we discarded the roentgen contrasting fluid used, and also the used 20 ml syringes, suck-up needles, spinal puncture needles, and sterile gloves. All suppliers later confirmed that no other incidents had been reported.

The diagnostic procedures were studied in detail. It was decided that all neurologists would wear caps and masks, which would cover the hair, mouth, and nose. Until this point, all doctors and X-ray personnel in charge had spoken and moved freely without washing their hands, wearing caps and masks, or removing wrist watches and rings.

The minimal sterile field consisted of the unfolded sterile glove-paper. Three neurologists allowed the assisting staff to remove the cap of the bottle of contrasting fluid with their ungloved hands; one punctured the disinfected stopper with a large bored suction needle.

Next to the small table with the sterile field were two open bags for the disposal of linen and used disposables. Awareness of asepsis was present but not profound. Hygienic margins seemed narrow, and a break in technique was easy.

RESULTS

We attempted to isolate the

patient organisms from the throats of the neurologist and 3 assistants; discriminating between the abundant normal flora, however, was difficult. Further analysis by the National Institute of Public Health and Environmental Protection laboratory (RIVM, Bilthoven, The Netherlands) of the meningitis-causing pathogens and the throat-colonizing flora provided additional information. Both microorganisms from the meningitis cases were found to be *Streptococcus salivarius*, biochemically the same, but not typeable. The isolates from the neurologist and X-ray staff also were found to be *S salivarius* (Table). Purification of the DNA of these strains proved impossible. Further typing by DNA fingerprinting or ribotyping was tried but was not successful.

DISCUSSION

Possible sources of contamination in these cases were the air, the hands of staff (the neurologist was wearing sterile gloves; the staff was not); the patients' skin (in spite of disinfecting with iodine 1% in ethanol 70%), the spinal puncture needle (sterile, disposable), the contrasting fluid (sterile), the suction needle (sterile, disposable), and the gloves (sterile, disposable).

The natural location of this category of streptococci is the throat. Therefore, in our opinion, the most plausible source of contamination was the throat of the X-ray assistant C. The spinal puncture needle probably was contaminated during the short period of time that the needle was exposed

TABLE
SELECTION OF BIOCHEMICAL REACTIONS (RIVM)

Source	Patient I	Patient II	Neurologist		Assistant A		Assistant B	Assistant C	RIVM
			(2×)	(2×)	(1×)	(1×)	Reference Strain		
Raffinose	+	+	-	+	+	+	+	+	95%+
Sorbitol	-	-	-	-	+	+	+	-	95%-
Bile/exculin (growth/black)	+/+	+/(+)*	+/-	+/+	+/+	+/-	+/(+)*	+/+	+/95%-
Bacitracine	+	+	+	+	+	+	+	+	95%+
Levan	+	+	+	+	+	+	+	+	+
API-20s	s salivarius	<i>S salivarius</i>	<i>S cremo-</i> <i>ris/</i> <i>them.</i>	<i>S salivar-</i> <i>ius</i>	N o result (sorbitol +)	No result	No result	s <i>salivarius</i>	<i>S salivarius</i>
Serology	Nontypeable	Nontypeable	H16+ + †	H17+ + + †	H17+ + + †	H17+ + + †	H16+ + †	Nontypeable	

. Dubious reaction.

†H16 and H17 = experimental antisera (RIVM).

to the air, during which the assistant was not wearing a mask.

Over the last 20 years, this sort of accident was not mentioned in the *Dutch Medical Journal*; in the Cambridge Medline, such cases have not been reported during the last ten years. Kelkar et al described epidemic iatrogenic meningitis caused by *Acinetobacter* species following the intrathecal administration of methotrexate. *Acinetobacter* was found to contaminate rehooded needles despite autoclaving.¹

The four neurologists in our hospital each have from ten to 30 years of experience. They were (and probably are still) sure they took the correct aseptic precautions. Annually, approximately 600 myelographies are carried out in our hospital. Moreover, these neurologists have administered cytostatica. They hold that these procedures are quite normally followed in hospitals by conscientious doctors without the use of caps and masks.

We inquired at two Dutch university hospitals: one did and one did not use caps and masks in these situations. We immediately took strict hygienic measures to

prevent future accidents. With some resistance, the neurologists could be convinced of the necessity of wearing caps and masks. X-ray personnel as well were required to wear caps and masks, and were convinced to draw the contrasting fluid out of the bottle after disinfecting the cap's surface with iodine 1% in ethanol 70% instead of lifting the stopper out. One year has passed and no further accidents have taken place.

These protocols are suitable for other procedures, such as inserting epidural catheters. Here too, complications rarely are mentioned in the literature. Kilpatrick described bacterial meningitis in ten out of 17 patients after recent spinal anesthesia.² Berenguer documented meningitis following epidural anesthesia as well.³

The question was raised by our infection control committee, as well as our neurologists, as to whether caps and masks should be used during all diagnostic spinal punctures. We initially took the view that this would be taking things too far, because nothing is inserted except the needle. Yet, it is conceivable that contamination could occur in the same way as we

assumed it occurred in these cases. Is the exception here still acceptable? If others have experience in this area, we would be grateful for feedback from readers.

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REFERENCES

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2. Kilpatrick ME. Meningitis, a complication of spinal anesthesia. *Anesth Analg* 1983;62:513-515.
3. Berenguer J. *Pseudallescheria boydii*, two iatrogenic infections, one following epidural anesthesia. *Rev Infect Dis* 1989;11:890-896.

Medical Waste

To the Editor:

In his commentary on medical waste in the November 1991 issue,¹ Dr. Keene focuses on the minimal hazards associated with its disposal and lists a host of authoritative references in support of his posi-