orphanage, but unfortunately they did not substantiate the allegations, even though Dr Zhang felt that one member was particularly sympathetic.

Throughout this period, she made systematic notes of the abuses and assembled evidence both from her own observation and from corroborating medical reports in the orphanage. She showed me the copies of her reports, together with Ai Ming's photographs. Largely on the basis of this evidence, Human Rights Watch/Asia published a report on conditions which concluded: "We estimate that in China's best known and most prestigious orphanage, the Shanghai Children's Welfare Institute, the total mortality in the late 80s and early 90s was probably running as high as 80%. Even official figures put the annual death to admission ratio at 77.6% in 1991."

Selecting children for death

Dr Zhang described the process by which so many children were allowed to die. She observed that children seemed to be selected for death if they had some deformity, were badly behaved or demanding, or were simply not liked. A consultation meeting took place between the staff, at which it was decided to deprive those selected of food and drink. Once the effects of starvation took hold, the child became ill and was then examined by a medical officer. At this stage, the phrase "treat accordingly" on the notes came to mean "let the child die." When children selected in this way were near to death from starvation or medical neglect, orphanage doctors were asked to perform a "medical consultation" which served as a ritual, marking the child for subsequent termination of care or life saving intervention.

When it finally became clear that the situation could not be improved from within, Dr Zhang made plans to

leave the country, followed later by her husband and children, a daughter of 21 and a son who is now 16, and also by Ai Ming.

I asked Dr Zhang how she had managed to leave under these circumstances but she was unwilling to provide any details on this point, perhaps for fear of implicating others. We know that she left China in early 1995, followed five months later by her family and Ai Ming. She then spent nine months assembling evidence and talking to human rights groups, including Physicians for Human Rights. Dr Zhang's family in China have been interrogated and her younger brother is required to report regularly to the police. Her supporters in Britain are at present extremely concerned about the welfare of the rest of the family who are still in China.

The testimony of Ai Ming as one of the few children who had survived the orphanage was important, and he was able to provide a graphic firsthand account of conditions. He talked about the high number of children who had died, and of his most vivid memory at the age of 12 of being forced to carry the corpse of recently dead child to the morgue. Later, as a young adult, he took photographs over several weeks that were used to condemn the orphanage regime.

For the future, Ai Ming told me that he has trained as a tailor and would like to use his skills to start a new life. Dr Zhang has no immediate plans to practise medicine in the West. She and her family want to find a settled way of life now that they have left China, but her immediate concern is to continue to campaign on behalf of the orphans of China and to bring their plight to the notice of the world community so that these abuses cannot continue.

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Lesson of the Week

Retention of drugs in venous access port chamber: a note of caution

Myriam Ben-Arush, Moshe Berant

Failure immediately to flush a port venous access device after delivery of drugs can have grave consequences

Indwelling tunnelled central venous catheters are widely used for venous access in patients who require intravenous nutrition, fluids, antibiotics, chemotherapy, and other drugs for protracted periods.^{1,2} Maintaining these central venous catheters warrants meticulous adherence to protocol, which includes adequately flushing after drug administration and leaving a heparin lock for preventing blockages, rigorous care of the catheter exit site on the skin, and, most important, strict observation of aseptic techniques when handling the external tubing so as to minimise the risk of infection, which is the main complication of long use intravenous catheters.^{3,4}

The advent of completely implanted subcutaneous port systems⁵ has simplified long term venous access and also appears to have reduced significantly the risk of infection.^{1,6} Central venous placement of port linked catheters is similar to that of external catheters, but the venous catheter of a port system, instead of exiting through the skin, is attached to a reservoir within a port chamber that is implanted in a subcutaneous pocket. Port systems are accessed by insertion of a non-coring needle through a septum that constitutes the dome of the port chamber under the patient's skin, and can be used for the same purposes as an external catheter.

The subcutaneously implanted port systems have

become greatly favoured by patients, particularly children and teenagers, who are spared the discomfort and embarrassment of tubing and dressings on their chest surface and may carry on their everyday activities unhindered. Care of the port system requires flushing with saline after each use in order to clear the dead space of the reservoir from retained drugs, and leaving a "heparin lock" to prevent clotting and blockage of the system. Failure to clear the port chamber after drug administration can be dangerous as illustrated by the following report.

Case report

A port catheter system was inserted for central venous access in a 2 year old boy following a diagnosis of neuroblastoma, and chemotherapy was started. Because of tumour progression the child also required radiotherapy. For each radiation session the patient received sedation-anaesthesia by intravenous administration of ketamine 10 mg, midazolam 0.5 mg, and atropine 0.15 mg in 10 ml of normal saline. After one such treatment the child was returned to the ward for heparin flushing of the system, and 10 ml of heparin solution (10 IU/ml) was easily syringed into the subcutaneous chamber. Almost immediately after

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completion of the procedure the child became pale, limp, apnoeic, and unconscious. The skin was mottled and felt cold. His pupils were widely dilated and the pulse was faint, with a rate of 68 beats/min. Blood glucose concentration was 4.7 mmol/l. Ventilation with oxygen by Ambu bag and mask was given for five minutes, after which the child began a gradual and steady recovery. One hour later he was his usual self again and could be sent home.

Discussion

The initial assumption was that the squirt of cold heparin might have stretched the superior vena cava wall and provoked a severe autonomic nervous response. However, when questioned the anaesthetist disclosed that he had neglected to flush the port system after administering the anaesthetic "cocktail" through it, whereby a proportion of the drug remained in the reservoir and catheter lumen. Hence, after the child had already recovered from the anaesthesia that he received for his radiation session, the heparin flush of the system delivered into him a rapid fluid bolus containing 2.5 mg ketamine, 0.04 mg atropine, and 0.16 mg midazolam, which provoked a terrifying, life threatening event.

The routine for intravenous delivery of the drugs must, as a rule, include flushing through the dead space of all intravenous cannulas at the time the drugs are given. Such action becomes especially important in the case of an implanted subcutaneous port venous catheter device, where dead space may range between 1.2 and 2.1 ml. Failure promptly to clear the drug from the port may result not only in faulty dosage but can have grave consequences when the retained drugs are later inadvertently flushed into the patient.

Although a literature search failed to disclose similar reports, the danger of drugs left in a port system appears to be very real. Colleagues relate of their

personal knowledge of near deaths associated with delayed flushing of drugs such as anaesthetics, including muscle relaxants, after the patient had returned to the ward. Port systems are unsuitable for intravenous anaesthetic and sedating drugs that are infused slowly so that the required dosage is judged by their effect, since there will always be a relative surplus of the medication left in the chamber, which can be only flushed into the patient. The only safe way to use a port device for anaesthetic drugs is to administer a predetermined dose to be completely flushed in, and treat any additional dose similarly.

Directions given by "use and maintenance" booklets and training of staff must emphasise the importance of immediate clearance of drugs from the port system. Our experience emphasises the need for awareness of the possibility of drugs left in the dead space of a port system and illustrates the potential danger associated with neglect to clear the port chamber each time after drugs are given.

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A MEMORABLE PATIENT

"The interest"

On a windy and chilly December morning our jeep was heading towards a small village for my supervisory visit to the health centre there, attached to my primary health centre. The men and women were busy working in the wheat fields, which promised to give a good crop in a few months. Seeing me getting down from the jeep with my health supervisor, all the men abandoned their work and started running, giving us very suspicious looks. I was perplexed.

I asked my health worker, a local man, about this. With a sheepish smile, he explained, "Sir, seeing your jeep, they must have mistaken you for the bank employees. These villagers, most of them quite rich, took out loans from the government banks on various pretexts a few years ago. But nobody has bothered to return the money, though many of them could easily do so. The bank people have now threatened legal proceedings. So whenever they come to the village in their jeep to recover the loans all the men run away to avoid them."

I felt disgusted at this disclosure, brooding over the irresponsible behaviour of people.

Days passed by. One night I was woken up by loud knocks at the door of my residence in the primary health centre compound. A middle aged woman, shivering in the cold, pleaded with me to do something for her only child who had been writhing in pain for a few hours. Her son, aged about 13 and with a malnourished frame, was groaning with pain in the "buggi" (ox driven cart) in which the woman had brought him from a village about 6 to 7 km away. I brought the boy into the centre, and my examination strongly suggested acute appendicitis. I explained to the woman that the boy needed urgent

surgical intervention in the district hospital, about 9 km away, as my centre was not equipped to deal with such patients. She looked gloomy. I could easily guess she was worried about the transport of her sick son. Our jeep was out of order. There was a driver with a three wheeler in the village who charged 30 rupees (60p) to go to the district hospital at night. I suggested this option to her. Her lips trembled and the sadness on her face became worse. Hesitatingly, she murmured, "I do not have a single paisa with me. Can you lend me 40 rupees (80p)? I shall return it in a few days." I had no doubts about the genuineness in her request, so I handed over the money. The driver came and rushed the boy to the hospital.

I forgot about the whole incident. Then one Sunday morning in June I was relaxing with a cup of tea. The wheat crop had been harvested and the fields in front of the centre looked barren. Suddenly a boy appeared at my gate. I thought hard, and remembered that he was the boy with appendicitis. I called him in and inquired how he was. Smilingly, he thanked me and said, "My mother was sorry that she could not come personally to thank you because of harvesting in the fields. But she has sent me with this money." He handed a few currency notes to me. It amounted to 50 rupees (£1). I looked at him questioningly. He continued, "Sir, apart from your 40 rupees (80p), which she had borrowed, this 10 rupee (20p) note is the interest on the delay in returning the loan."

In a flash, the scene on the wheat fields a few months ago appeared in front of my eyes. I was moved and could barely control my tears. I patted him over his shoulder and returned the "interest" to him.—BIR SINGH is an associate professor in community medicine in New Delhi