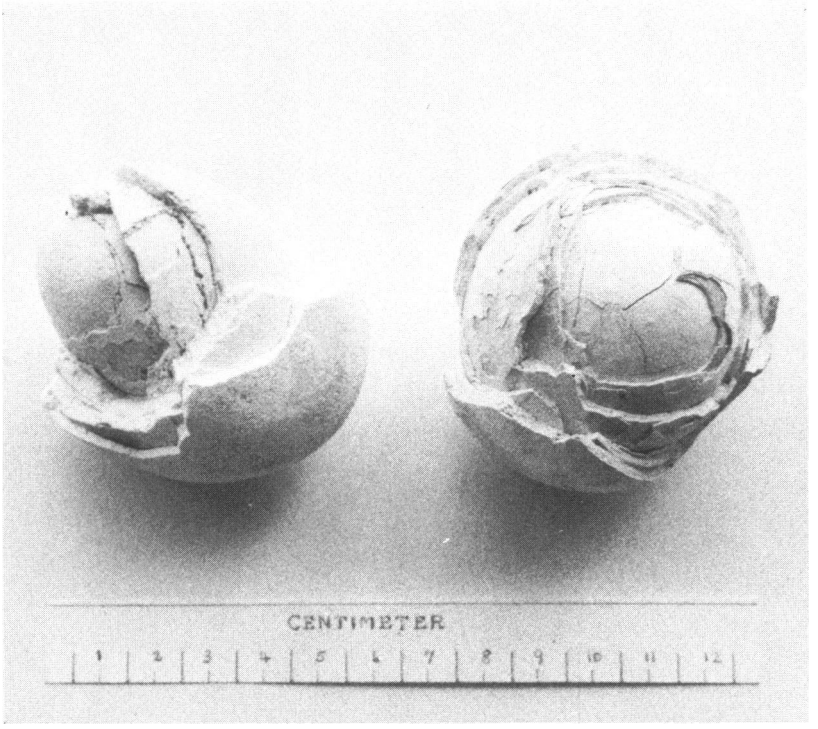
Bladder stones removed from Thai patients

Bladder Stones in Children

MAX COURSON

Layered bladder stones removed from Thai patient



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Photos by U.S. Army SEATO Medical Research Laboratory and Clinical Research Center.

The urinary bladder stone is a children's disease recorded in some of history's most ancient medical reports. It continues to plague thousands of youngsters throughout the world today, but the bladder stone may be on its way toward eradication—thanks to a series of events involving a University of Hawaii professor of food and nutritional sciences.

Research

Robert Van Reen first became aware of bladder stones in 1958 when he conducted laboratory experiments with rats to determine the effects of protein and minerals on dental cavities. After feeding one group of rats a high mineral-low protein diet, many died. Autopsies showed stones in the rats' bladders and kidneys. Very few stones were found in rats on high protein diets.

Van Reen theorized that high protein diets prevented stones in the animals by counteracting the urine's high alkali content caused by the high mineral-low protein diet.

The following year, Van Reen became part of a team from the Medical Research Institute in Bethesda, Md., which conducted a nutrition survey in South Vietnam. There they found many children suffering from bladder stones. In 1960, he took part in a similar study in Thailand which uncovered an even larger number of children with stones. Most of these children came from poor, nonurban families whose diets consisted essentially of low protein sources, such as vegetables and starches.

Securing funds from the Interdepartmental Committee on Nutrition for National Defense, Van Reen conducted a worldwide study of the subject and found many areas affected by this disease. His report identified a broad geographic belt encompassing southeast Asia, northern Africa, the Middle East, and the Indian subcontinent as regions where bladder stones appear in children. Those affected are usually from 1 to 10 years old and are almost always male. "The reason boys have bladder stones more often than girls is probably because the female urinary tract is larger and can pass the small stones easier," he explained.

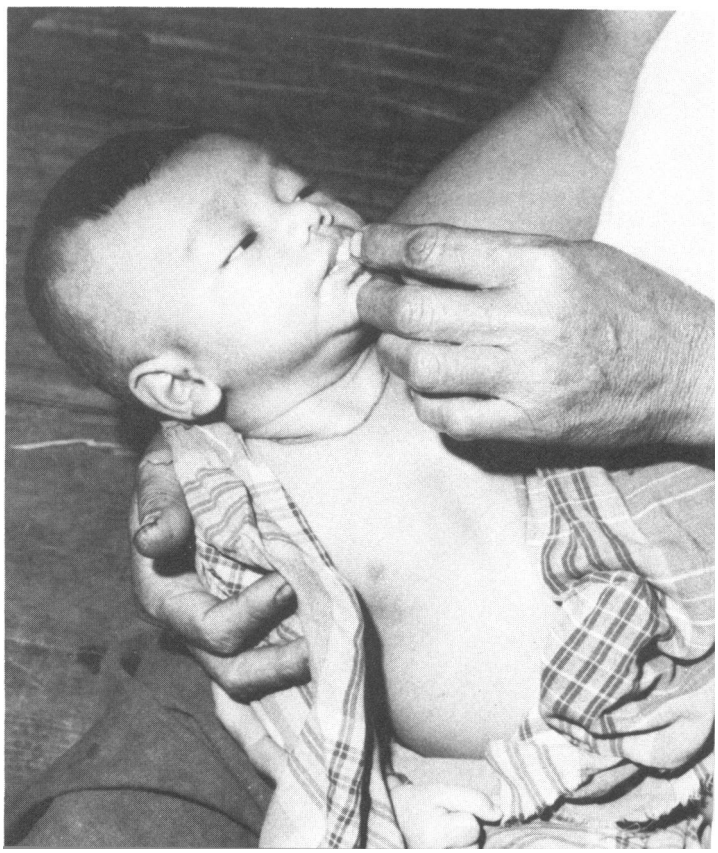
Children with stones usually have blood in their urine, suffer pain when urinating, and occasionally are unable to urinate at all. "In some instances you can simply look at a child and tell he has stones because in his effort to dislodge the stone, he will hit or kick himself in the groin, bruising the tissue in that area," Van Reen said.

Thailand Study

Van Reen began plans for a detailed study of the disease in Thailand because of the prevalence of bladder stones there, and because local investigators had already launched epidemiologic studies to locate where most cases were in that country. Directing this particular project was Scott Halstead, professor and chairman of the department of tropical medicine and medical

Thai mother spits out the sticky rice preparation which she has chewed

Thai mother force feeds the sticky rice preparation to her small baby



microbiology at the University of Hawaii.

Halstead's survey disclosed that most cases occurred in Thailand's northern provinces and almost always among rural families. This led to a study of nutritional practices of the provinces' rural families. Researchers learned that in almost every instance rural village mothers force-fed their infants with a cooked, sticky rice preparation which the mothers first chewed until soft. The pulpy, starchy remains were then fed to the child. This form of feeding sometimes began as soon as 1 day after a child's birth. "The sticky rice replaced the baby's demands for breast milk so the mother could get back to the field and work," Van Reen said.

The end result is a form of malnutrition among the small children, especially a lack of proteins and phosphates. This abnormal condition causes some drastic chemical changes within the children's bodies that encourage the development of stones in the bladder. A major factor is the production of calcium oxalate crystals which tend to clump together in the urine. Ultimately, the clumps can become too large to be passed from the body in the normal urine flow.

Van Reen and his associates next began a dietary program designed to prevent development of bladder stones in children. A trial program of providing nutrient supplements is currently underway in Thailand involving a selected group of children living in endemic bladder stone areas.

The major thrust is to provide substances to counteract the stone-forming chemicals in the body that result from low protein diets. Directing this effort are Dr. Aree Valyasevi, dean of the Ramathaibodi Hospital in Bangkok, and Dr. Sakorn Dhanamitta, a pediatrician at the same hospital. Both have played major roles in investigating the bladder stone problem in Thai children.

Hope for Other Countries

"Ultimately, education and improved standards of living in developing countries will provide the final solution for stone disease in children," Van Reen said. "Until then the Thailand project is showing how health officials can combat this agonizing disease."

Because of his leadership in studying bladder stone formations in children, the World Health Organization has asked Van Reen to organize an international symposium on the subject. This meeting will be held in 1972 in Bangkok, with representatives invited from the sections of the world where children still suffer from bladder stones.

Dr. Aree Valyasevi examines a group of Thai children while Dr. Robert Van Reen looks on