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**READY FOR THE NEXT BIG STEP**  
**New rods offer hope to brittle-bone victims.**  
**Aaron Derfel**

Two-year-old Hanan Al-Jotuili hasn't learned to walk yet - and it's not from a lack of trying. The Kuwaiti girl with bright brown eyes and an infectious smile is known as a "crystal kid" - a nickname that hints at the rare genetic disorder that struck her when she broke her leg at birth. Osteogenesis imperfecta, or brittle-bone disease, robs people of collagen - a major protein of the body's connective tissue. Over the course of a lifetime, some sufferers can break their limbs hundreds of times. In the most severe cases, newborns die shortly after birth. But Hanan's parents have high hopes for her after a Montreal orthopedic surgeon inserted an ingenious stainless-steel rod in her leg this week for the support that is vital to walk. The rod is no ordinary piece of steel, and Dr. Francois Fassier is not your typical surgeon. He runs clinics at the the Montreal Children's and Shriners hospitals that are at the forefront of treatment of pediatric brittle-bone disease, attracting hundreds of patients from around the world each year. Fassier and colleague Dr. Pierre Duval recently invented a new kind of rod that is expected to revolutionize the field of brittle-bone surgery.

Unlike the standard three-piece rod that's been in use for the last 40 years, this two-piece implant does not require splitting open the knee for insertion. It also tends not to break like the standard rod, which can become dislodged from the femur and poke into the buttocks. That means that Fassier will probably perform fewer operations on a child whose legs outgrow the rods. "If we can reduce these mechanical complications, I think we will have achieved our goal," Fassier said in his office, glancing at an X-ray of malformed legs. "When you have to tell a child that he has to go to sleep again for another operation because the rod is bumping him in the buttock, it's extremely frustrating - and it costs a lot for society." On the 10th floor of the Children's, Hanan, her right leg in a cast, was playing with a plastic straw the day after her operation. Hanan's 27-year-old mother, Aisha Al-Kandary, bent over her smiling daughter, stroking her hair. "I'm so happy," the mother said through an interpreter. "I hope she's going to start walking soon." Next week, Fassier will insert a rod in Hanan's left leg to strengthen it.

The Kuwaiti government is paying the cost of the operation and hospitalization. An average of 500 children worldwide undergo the standard implant operation each year.



*Aisha Al-Kandary comforts her daughter Hanan, 2, at the Montreal Children's Hospital a day after an orthopedic surgeon inserted a telescopic stainless-steel rod in her right leg.*

A Montreal bioengineering firm, **Pega Medical**, was involved in developing the Fassier-Duval rod. The company invested \$300,000 in the project and plans to sell each rod for \$1,500. "After the first surgery with the new rod (last March)," said Pega Medical president Ariel Dujovne, "a physiotherapist who was treating the child came to us and wanted to know what we did to the boy. "We asked why. Well, the physiotherapist told us, the next day after the surgery the boy was playing." The Fassier-Duval telescopic rod also can be inserted in the arm, which is not possible with the standard rod. The secret to its success is that it screws into the top of the femur and the growth plate of the knee, while the standard rod has no screws. "Obviously, this rod doesn't cure the disease," Fassier said. "The patient will still have brittle-bone disease. But we hope that with the human-genome (analysis), we will one day be able to cure the disease in the genes."