

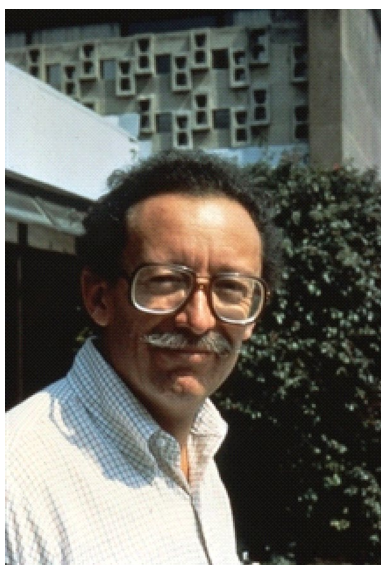


Historical perspectives—Eduardo R. Luque

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Eduardo R. Luque, MD

The timing of major changes in a field is not linear, and can occur unexpectedly, and arise from outside the usual source.

Eduardo R. Luque radically changed the thinking and practice of the correction of spinal deformity around forty-five years ago, and his ideas started not from one of the recognized centers of excellence for surgical practice at the time, but from his practice in Mexico City, Mexico.

Dr Luque was proud of his Mexican and Basque ancestry. He attended medical school in the United States at Stanford University, and his orthopedic residency was at the

University of Southern California, under Doctor Joseph Risser (of the “Risser sign”) and he was a senior registrar at the Princess Elizabeth Orthopedic Hospital in Exeter England under Dr Norman Capener (of the “Capener approach and the Capener Gouge). He worked at the ABC Hospital and the Shrine Hospital in Mexico City.

Dr Luque promoted the concept of segmental spinal instrumentation, (which he called SSI). In today’s world, segmental spinal fixation by pedicle screws is standard in most scoliosis surgeries, so it is hard to imagine how radical this concept was seen by the scoliosis world when he introduced it in the late 1970s. The standard at that time was correction by distraction using a single concave Harrington rod, anchored by a hook under the facet proximally, and a supralaminar hook distally. All correction came from distraction along the rod.

Instead, Luque placed sublaminar wires bilaterally at each level and gained correction by transverse approximation, bringing each spinal segment to bilateral rods by tightening the wires to the rods. The secure fixation would allow no need for postoperative immobilization with casting or a Milwaukee brace as was usually used following Harrington instrumentation. This was important for patients who had travelled from remote parts of Mexico where local care was scarce. In addition the method of correction was particularly helpful for neuro muscular curves requiring fixation to the pelvis. Scoliosis secondary to poliomyelitis was common in Mexico at the time.

As word of his ideas spread, interested surgeons, mostly from southern states of the USA and from Canada travelled to Mexico City to visit and learn from his ideas. A Luque study group was formed that met 2–3 times a year to watch surgeries at the ABC Hospital in Mexico City, and then proceeded to Luque’s ranch home for vigorous debate. This group amplified the concepts of segmental fixation with concave and convex rods, added rods present in the sagittal plane to preserve sagittal balance, and

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especially lumbar lordosis, and advocated methods to achieve apical derotation.

Some of the ideas that emanated from the Luque Study Group included: Doctors Ben Allen and Ron Fergusson from Galveston, Texas introduced the Galveston pelvic fixation, which became the standard method of pelvic fixation for decades. Dr Luque was concerned that enhanced correction could result in spinal lengthening that in turn could cause neurologic complications. He preached spinal shortening wherever possible. Dr Charles Heinig from Charlotte NC described the “eggshell procedure” which was the first description of the pedicle subtraction osteotomy.

Tony Herring and Denis Wenger from Dallas, Texas published 40 consecutive Luque rod cases, and Dr J. Andy Sullivan from Oklahoma published a study comparing Harrington and Luque instrumentation.

For early onset curves the group proposed non rigid segmental fixation that would allow growth with the wires sliding along the rods (called the “Luque trolley”). This was later abandoned as many cases went on to spontaneous fusion, but the concept started interest in growth sparing procedures for early onset curves.

Doctor Gordon Armstrong from Ottawa, Canada, and Doctor John Hall from Boston, proposed the “Luque rectangle”, for short segment lumbar fusions and for reduction and fixation of spondylolisthesis. Up to that time, most short segment lumbar fusions were treated with immobilization with a cast, without instrumentation.

Biomechanical engineer Dr Alan Tensor informed the group on mechanical aspects of the instrumentation and methods of testing proposed rod plans. Charles Johnson, of Dallas tested Luque instrumentation on goat spines and showed that the more secure the fixation, the greater the resulting fusion.

The first international course on Luque segmental spinal instrumentation was held in New Orleans in 1981, with many attendees, and Dr Luque went on to lecture and promote his ideas at medical centers worldwide.

Dr Luque edited a publication, “Segmental Spinal Instrumentation” in 1984, with contributions from most of the study group.

The Scoliosis research Society enacted the "Eduardo R Luque Memorial Scholarship" which supports further education and skill enhancement for spine surgeons from Mexico, Central and South America.

Dr Luque died unexpectedly in 2002. His legacy is a contribution that remains an important part of the evolution of modern scoliosis and spine surgery.

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