

PIONEERS IN RHEUMATOLOGY

Sir John Charnley

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The pioneer of modern hip replacement surgery.¹ Sir John Charnley was born on 5th August 1911 in Bury, Lancashire, U.K. His father Arthur, was a chemist and his mother Lily a trained nurse.

Charnley studied at Bury Grammar School. At the school he did not have an academically distinguished career, but had an inclination towards science. Recognising this, the school headmaster, Leonard R. Strangeways, encouraged him to study medicine. He joined Medical School of the Victoria University of Manchester in 1929. Charnley graduated in 1935 with MBChB, winning prizes and scholarships. He also obtained BSc in Anatomy and Physiology. In 1936, at 25 years of age he became a fellow of the Royal College of Surgeons, the youngest age permitted by the college.

Between 1937 – 1940, Charnley was a resident surgical officer at Salford Royal Hospital, demonstrator in Physiology at King's College, London, and Resident Casualty Officer (CMO) at Manchester Royal Infirmary. As a CMO he had an opportunity to interact with orthopaedic surgeons. In May 1940 during World War II, he joined Royal Army Medical Corps. During the military service he was posted in Cairo where he worked under Brian Thomas, who was an orthopaedics surgeon. It is here that here he developed an adjustable version of

Thomas walking caliper.² It was the first of the many of his inventions. Impressed with his work, Charnley was sent to 2nd orthopaedic centre and given charge of the new orthopaedic workshop.

Charnley finished military service in 1944 and joined Shaftesbury Hospital, but returned to Manchester Royal Infirmary to work under Sir Harry Platt as a lecturer. Platt was instrumental in encouraging him to train in elective orthopaedic, under Robert Jones and Agnes Hunt at Oswestry Shropshire. He came back to Manchester and was appointed Honorary Orthopaedic Surgeon. Following Platt's retirement in 1952 Charnley became a Consultant Surgeon. In 1949 he was appointed visiting orthopaedic surgeon to Wrightington Hospital, where he moved his clinical practice in 1962 to concentrate on his research on hip replacement.³ Incidentally in 1948 he had wondered about working in USA.¹

At Wrightington hospital Charnley built a biomechanical laboratory (opened in June 1961) to test his instruments and inventions. For this he had organised a fund raising campaign.¹ Based on the studies he concluded that for smooth hip joint movements (low friction movement) congruity of the joint surfaces was more important than the fluid lubrication and not the other way round. This concept led to the development of low friction arthroplasty.¹

The successful development of hip arthroplasty was possible only after overcoming many hurdles such as selecting appropriate lubrication fluid, identifying the right qualities of the cementing material, prevention of infection, restoring the altered mechanics of diseased hip, designing durable surfaces.^{1,2} Charnley collected post-mortem specimens bequeathed to him

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by his patients to study the bone-surface interface.³ Charnley hip replacement became a practical reality in November 1962 and became the gold standard for hip joint replacement surgery and has remained so.³ Charnley had provided a solution to painful diseased hip joints. Charnley's contributions to orthopaedic surgery are not limited to hip arthroplasty. He published authoritative books "The closed treatment of common fractures" and "Compression arthrodesis" and published more than hundred original papers.²

Charnley received many national and international awards including Lister Medal (1975). He delivered Lister oration on "The origins of post operative sepsis in elective surgery" at Royal College of Surgeons,

London. He was knighted in 1977 by Queen Elizabeth II.

Charnley continued to work till the end; he died in harness.³ He passed away on 5th August 1982. Mrs. Charnley continued his work by establishing John Charnley Trust which supports young surgeons to train in orthopaedics.

References

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3. BM Wroblewski. Professor Sir John Charnley – Heberden Historical Series *Rheumatol* 2002;41:824-825.