

# Max Sänger (1853-1903): An Historical Note on Uterine Sutures in Caesarean Section

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## Abstract

Max Sänger was one of the best known German gynecologists at the end of the nineteenth century and is principally remembered for his introduction of sutural closure of the uterus in caesarean operations. This practice represented a major turning point in the development of the caesarean technique. Prior to Sänger, the uterine wound was not sutured and the most frequent procedure was the Porro operation of caesarean hysterectomy. Sänger's operation contributed to a significant reduction in haemorrhage and sepsis with a major decline in maternal mortality.

## INTRODUCTION

Max Sänger was born in Bayreuth in 1853 and studied medicine at the University of Leipzig. [Fig 1.] He continued his graduate studies in pathology and obstetrics and gynecology under Professor Karl Credé (1819-1892). In 1882, whilst still a graduate student, he published his paper which proposed the closing of the uterine wound in the caesarean operation.[1] One year earlier, Adolf Kehrer (1837-1914) performed the first lower segment caesarean operation in Germany. When combined with Sänger's method of uterine closure, this new procedure achieved widespread acceptance in both Europe and the United States.

Sänger's surgical expertise and academic standing led to his appointment as Professor of Obstetrics and Gynecology at the University of Leipzig where he spent most of his professional career. He achieved an international reputation and his name became associated with 'Sänger's operation' in which the uterine wound was closed with three tiers of sutures. He travelled to international congresses in both Europe and the United States and published widely in many areas of gynecology and obstetrics. His publications included over 130 papers which was an exceptionally large number for that era. In 1890 he was appointed Professor of Obstetrics and Gynecology at the German University in Prague. His time in Prague was marked by ill health as he developed syphilis peri-operatively and died from complications in 1903. [2]

## Figure 1

Figure 1: Max Sanger (1853-1903)



## UTERINE SUTURES

When Sänger wrote his monograph in 1882, the Porro operation of caesarean hysterectomy was at its height. Eduardo Porro (1842-1902) advocated the procedure of hysterectomy in a caesarean operation which substantially reduced foetal and maternal mortality, but at the cost of the mother's future mortality. [3, 4]

Prior to Sänger, there was the general belief that sutures were ineffective in uterine muscle. The contraction and relaxation of the uterine wall was considered a contraindication for sutures. When used in surgery, sutures had to be removed and it was thought impossible to achieve this once the abdominal wall had been closed. The influential 18th century French obstetrician, André Levret (1703-1780) advised that uterine sutures were contraindicated and '...were not only prejudicial but were absolutely useless because of the prodigious contractions which the uterine muscle undergoes following delivery.' [5] At the time, non-absorbable sutures usually of silk origin were occasionally used, but the outcomes were frequently associated with uterine infection.

Sänger's paper in 1882 advocated that uterine suturing was imperative and he promoted the use of silver sutures in the caesarean operation. [Fig 2.] This new material had originally been used by Marion Sims (1813-1883) in obstetric practice. [6, 7] The silver sutures produced minimal tissue reaction and were associated with a low rate of uterine infection or peritonitis.

Sänger's operation proved highly effective and became popular in Europe and North America. Many late nineteenth and early twentieth century obstetricians made further refinements in the technique. By the end of the nineteenth century, maternal mortality had fallen below ten percent.

**Figure 2**

Figure 2: Max Sänger's paper published in Leipzig, 1882



## SÄNGER'S LEGACY

Although the use of uterine sutures seems obvious, at the time it was a revolutionary concept in caesarean operations. Sänger deserves the credit for the development of this technique which became the standard procedure leading to a spectacular reduction in maternal mortality. His monograph in 1882 is regarded as one of the most outstanding contributions to obstetric surgery. At the time of his death in 1903, it was observed that Sänger '... had removed from the obstetric art probably the final reproach of the cruelty of ignorance. He rehabilitated, almost invented, the caesarean section.' [8]

During his life Sänger was known as a prodigious worker and investigator. In 1894, together with August Martin (1847-1933) he founded the journal, *Monatsschrift Für Geburtshilfe und Gynaekologie* which became the journal, *Gynecologic and Obstetric Investigation*. As well as his scientific contributions, Sänger had wide interests in the arts and humanities. He wrote several historical reviews and

biographies and was fluent in German and Norwegian. His wife was Norwegian and they were close friends of the composer Edvard Grieg (1843-1907) and his wife Nina. [9, 10] Sanger was one of the most renowned gynaecologists of the latter part of the nineteenth century. His advocacy of uterine sutures in obstetrics has established him as one of the founding fathers of the modern caesarean section.

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