Two anniversaries related to Dr. Viktor Finderle (1902–1964)
One hundred years since his birth and fifty years since patenting his vacuum extractor

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The objective of this paper is, on the occasion of the centenary of his birth and the fiftieth anniversary of patenting his vacuum extractor, to remember the extraordinary Croatian obstetrician and gynecologist Dr. Viktor Finderle.

For this occasion archives, bibliographic data and memories of his contemporaries have been used. (The first co-author of this paper was his student and collaborator, and the second is his grandson who is also a gynecologist.)

Short biography of Dr. Viktor Finderle

Dr. Viktor Finderle was born on December 6, 1902 in Aurisina near Trieste (at that time Austro-Hungarian Monarchy) to a Croatian family living there because of his father’s state service. The family soon moved to Rijeka where young Viktor attended the elementary and high schools, and then moved to Zagreb where he finished his studies in the medical faculty in 1927. He certified his diploma in Sienna and passed the state exam in Rome, after which he continued his career in Rijeka, at that time part of Italy. As a member of the surgical department he additionally improved his knowledge of gynecology and oncology by attending many courses in Paris, Berlin, Hamburg, Dresden and Prague and specialized in gynecology in Padua. In 1941 he was mobilized by the Italian army and in 1943, after the surrender of Italy, he joined the Croatian Partisans where he distinguished himself through being in charge of war hospitals and organizing sanitation. He was injured during an enemy attack, and as an injured person was transferred to an allied hospital near Bari, Italy, where he stayed in active military service until the end of war. Afterwards, he returned to Rijeka where he remained until his death in 1964. During this period, he became not only the leading gynecologist and oncologist but also a civil servant – the founder of the midwifery school and the blood-donor service in Rijeka, deputy lord mayor and the promoter of the idea to found the medical faculty in Rijeka.

As a lecturer or visitor he attended many international conventions in France, Spain, Portugal, Italy, Austria, Germany, Tunis and Morocco. He published papers on empyema, thyrotoxicity, uterine hemorrhage, rupture of the uterus, extraterine gravidity, fetal asphyxia, painless birth, anesthesiology, immobilization of the traumatic arm and surgical techniques in both national and international journals (see bibliographic data). He also wrote books and textbooks and many articles in various periodicals, journals and magazines.

Of his many practical inventions, some of which were conceived during the war, his “two-bottle system” for infusion and transfusion is used to the present day. His immobilization and surgical operation of war wounds and some operative modifications in gynecology and obstetrics were most useful.

Vacuum extractor

Undoubtedly, the most famous of Finderle’s achievements was his construction and introduction of the vacuum extractor in obstetrics. It is useful to remember the
historical development of obstetrical instruments for vaginal delivery, just as the Italian gynecologist Luigi Carenza has done by listing a series of forceps and similar instruments in use over the last hundred years. Carenza concluded by listing his own successes with Finderle’s instrument [1, 2]. Finderle himself, in his papers, very often recognized the significance of his predecessors. For example, J. Simpson in 1948 with the “air tractor” idea, as well as McCackey in 1891. J. Torpin in 1938 used a similar but improved idea, and Y. Couzigou in 1947 used the prototype of his extractor only once [3]. In 1951, O. Köller demonstrated his extractor and described its use in uterine atonia [4]. In the same year, E. Gastaldo introduced his “tocacetabulum”, using it in such a way that with the help of negative pressure in the vagina he increased intrauterine pressure and thus shortened the duration of delivery [5].

As his contemporaries tell, in 1946 Finderle had the idea of constructing his vacuum extractor in quite a strange way. He remembered the behavior of an octopus that is able to perform incredible movements with its legs and attach itself onto surrounding rocks or enemies. From this concept, he gradually came to the idea of a horn-shaped instrument; the broader end is attached to the fetal head using negative pressure, thus permitting extraction of the baby with little power and some skillfulness.

With the help of his friends, an engineer and a tool mechanic, he made drawings and a mould for production of a prototype of the horn in the “Torpedo” factory in Rijeka in 1949. The rubber parts necessary to produce the negative pressure and to attach the instrument to a fetal head were produced in the “Sava” factory in Kranj, Slovenia.

A 200- or 250-ml metal or glass syringe was used to produce negative pressure, and a valve for pressure maintenance was placed in the central part of the rubber tube. This instrument with all its pertaining projects was duly registered with the patent registration office in the ex-Yugoslavia, which on January 15, 1952 issued the invention certificate (patent) for the “Extractor for fetal extraction in delivery” with priority right from January 29, 1951 onwards.

This vacuum extractor was first used on October 21, 1950 in the maternity hospital in Rijeka and it stayed in use until October 13, 1955, when Dr. Finderle left the hospital. During that period the vacuum extractor was used 226 times: 221 times successfully and 15 other deliveries requiring the help of forceps. After that period vacuum extractors were not used until 1966, when the use of Malmström’s extractor began [6, 7].

Dr. Finderle’s first paper on his experience of 71 cases in which his vacuum extractor was used was submitted to the Acta Medica Iugoslavica on May 26, 1951 and was published in the first issue in 1952. Up to 1955, he published papers in both national and international journals, after which Finderle’s vacuum extractor became accepted in many delivery rooms and serious evaluations of it were published soon thereafter [1, 2, 8]. The most important paper was published in 1955, in the American Journal of Obstetrics and Gynecology.

With the acceptance of Finderle’s original idea, some technically improved modifications of the instrument were constructed, of which the extractor of the Swedish gynecologist Malmström and engineer Uddeberg was the most successful. They modified Finderle’s extractor by adding a manometer that, with a few other modifications, permitted more accurate adjustments of negative pressure and reduced hematoma of the fetal head. Because of these modifications and Finderle’s giving up on improving his own model, Malmström’s model later became universally accepted and known to most obstetricians as Malmström’s extractor.

Finderle did not continue improving his model because it would have required not only the involvement of a wider team of different professionals but also much greater financial support, which unfortunately did not come his way.

Nevertheless, Finderle’s idea was not completely forgotten. Many letters and questions about his extractor continued to arrive from all around the world to the Clinic for Gynecology and Obstetrics at the Medical Faculty in Rijeka and to its head, Prof. Dr. Drago Vrbanic, and his colleagues. It is interesting to mention the correspondence with Chinese gynecologists who obtained good results with his model for some time.

The idea of the vacuum extractor, with improved models, definitely found its place in modern obstetrics [11–14] although the original Finderle’s extractor was abandoned albeit not forgotten. Finderle’s prototype from 1951 is exhibited in the new Clinic for Gynecology and Obstetrics in Rijeka.

**Conclusion**

From the evidence there is no doubt that the Croatian gynecologist and obstetrician Dr. Viktor Finderle, guided by his own inspiration and with little or no previous experience, was among the first in the world to experiment with a vacuum extractor, receiving the patent for his prototype in January 29, 1951. In addition, he was undoubtedly the first to publish successful results achieved with his vacuum extractor in a significant number of cases.

**Finderle’s Bibliography**

1. Finderle V (1933) Sulla eziopatogenesi della gravidanza ektopica e su un caso di gravidanza gemellare tubarica