Update on Bolognese surgeon Dr. Benedetto Schiassi: the importance of *Schiassi's tentorium*

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Abstract

Risk of infection remains a major concern for surgeons. The expansion of surgery towards the end of the 19th century determined a noticeable increase in septicemia and gangrene, and surgeons developed various techniques to limit them. In a previous publication, we reminded our readers of one of the gems of Italian surgery, Dr. Giuseppe Ruggi, who operated in Bologna from the end of 19th to the beginning of the 20th century. To him we owe the introduction and dissemination of the antiseptic method in Bologna. His scientific activity continued with Dr. Benedetto Schiassi, his successor.

The techniques used to avoid microbial contamination by the Italian surgeon Dr. Schiassi, are particularly interesting, as Schiassi's tentorium is still useful.

Despite advances in surgical technologies, many innovations to prevent infection in surgery proposed in the past are still relevant today.

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Introduction

In a previous publication, we remembered one of the gems of Italian surgery, Dr. Giuseppe Ruggi, who operated in Bologna from the end of 19th to the beginning of the 20th century.[1] To him we owe the introduction and dissemination of the antiseptic method in Bologna. The increase in surgical interventions at the end of the 19th century coincided with a noticeable increase in septicemia and gangrene. In 1924, Ruggi commented on erysipelas: … *erysipelas infected surgery rooms in such a way that the sick, one by one, succumbed to death, without the possibility of treatment.*[2] In his 1879 book, *The art of treating according to the Lister method,*[3] Ruggi introduced Lister's method and suggested should be extended to all patients in the surgery department. He operated at the Ospedale Maggiore (Bologna, Italy) and felt that Lister's method, *could completely wipe out all infections from hospitals stemming from wounds treated in the traditional manner*.[3] At the time, medication was placed on gauze that covered the entire wound or operated section using the *mackintosch* method.[4] The strips of gauze were then covered and compacted by larger pieces of phenolic cloth. The cloth was made of loosely bound cotton, wetted with a mixture of crystallized phenolic acid, 5 parts of common resin, and seven parts paraffin.[4] The cloth was prepared in the hospital by, *running it through a machine similar to paper being run through a printing press, once [it] had been wetted with the heated mixture*.[4]

The surgeon Benedetto Schiassi

Despite Ruggi's efforts, infection remained a major problem felt by the surgeons of the city and the university. Benedetto Schiassi (Mezzolara di Budrio 1869-1954) was one of Ruggi's most important successors (Figure 1). An eclectic Bolognese surgeon, Schiassi reached international fame through various scientific publications within the medical and surgical field. He is known as the *global father of psychosomatics*, a title recognized at the 1967 International Medical Conference in Vienna for his 1910 discovery of the role of the psyche in pathogenesis of duodenal ulcers.[5]

Benedetto Schiassi was a true scholar, accustomed to epistemological musings and supporter of the neo-hippocratic current. In 1905, he founded the Medical Surgery Society to ignite collaboration and sharing of knowledge amongst surgeons and internists in an ethical manner. In 1948, he was elected a Nobel Prize candidate by Dr. J. Spivack and a group of Chicago researchers.[6]

His most important work occurred simultaneously with monumental studies at the University of Bologna conducted by Dr. Augusto Murri, with whom Schiassi was a close confidant, Pietro Albertoni, and physiologist Salvatore Tommasi. At the beginning of his career, Schiassi was the student of Professor Marcello Putti. In 1895, Putti and Schiassi performed the first neurosurgical operation in his home in Mezzolari of Budrio, a town near Bologna. At this time in Italy, it was impossible to break open the skull during operations. In 1899, Schiassi again showcased his multifarious nature by being the first to introduce spinal anesthesia. He also developed various other innovative methodologies for the operating room.[6]

Figure 1. Dr. Benedetto Schiassi.

The importance of the *Schiassi's Tentorium*

In the article titled, *The simplicity and efficacy of the 'Schiassi tentorium'*,[7] the introduction quotes Schiassi stating: *Several of my colleagues recently assisting me in surgery have decided to name a device, that allows one to partially move a part of the peritoneal cavity to work on an area covered by the cavity, the Schiassi tentorium* (Figure 2).

Schiassi used this device in hysterectomies, ablation of appendages, and operations of the pelvic colon.

The author begins by describing the application method: after incision of the abdominal wall, *one puts into place the stretcher to amply open the wound, specifically on the pubic side to have increased cavity access. Then one chooses a piece of gauze of the correct dimensions to be placed in front of the wound, so that half of the inferior segment corresponds to the umbilical segment of the incision. Here one makes the first suture.*

Two other phases follow: three sutures are placed on the side,

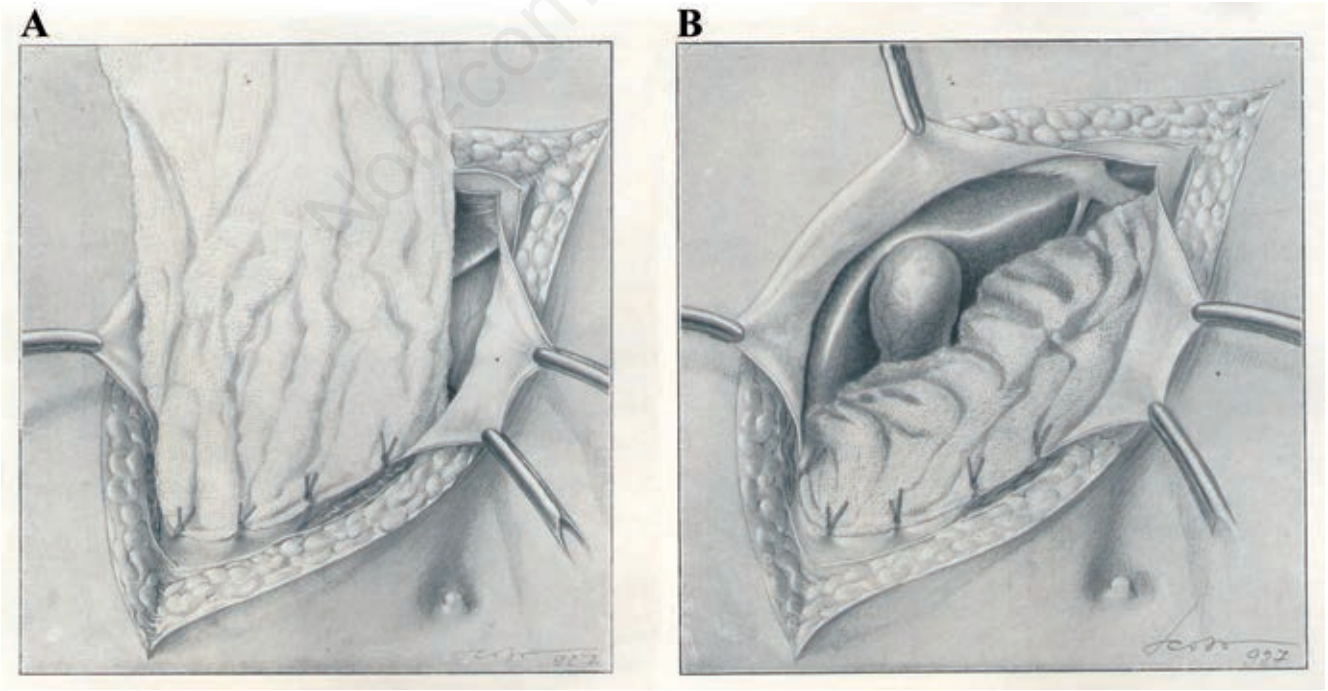

Figure 2. *Schiassi's tentorium*: A) the fixation by suture of the protective gauze to the surgical incision margins; B) the insertion of free gauzes to surrounding the surgical field and absorb fluids. *Modified by Ruggi, 1924.*[2]

so that, in front of the wound, the diaphragm is held fixed on the juxta-umbilical side, and the mobile side remains free for weaving into the abdominal cavity.

The author adds that, *the gauze should be placed and held tight, uniformly, so that the pelvis remains completely excluded from the rest of the abdominal cavity until the end of the operation*. Schiassi specifically states that, *the use of other gauze strips, small or large, to keep the operatory field clean, should always be used within the exact space outlined by the tentorium*. Not only the additional gauze, but also any instruments used by the surgeon during the operation should remain in the field.

Upon termination of the operation, Schiassi suggests that *the entire operatory field will be revisited and cleaned, and every gauze, large or small, and every instrument, will be removed. Finally, the foundation sutures of the tentorium will be removed, by tweezers, not hands.*

One may ask, what Benedetto Schiassi's objectives were for the use of the *tentorium*. The risk of microbial contamination of the large peritoneal cavity has always been notoriously severe. The contamination can derive from the transport of germs during operations.[7] After reminding the reader of the techniques to avoid microbial contamination, the author writes: *in comparison to the typical gauzed used, which is made up of various elements, the tentorium offers superior protection against contamination due to its construction. Because it is made of a single element, it can withstand force and movement both from the surgeon during the operation, and from possible changes in position of the patient.*

We now arrive at another major reason for the importance and usefulness of the *tentorium*. Referencing Professor Ruggi, Benedetto Schiassi often said: *Small incisions, small surgeons; great incisions, great surgeons*. Gathering inspiration from this phrase, the author writes: *great incisions, great success* - confirming that in cavity surgery: ... *success is more easily obtainable by the deeper incision*. Often, after a large abdominal incision, the intestine tends to occupy the same space as the wound, thus interfering with the surgery. Surgeons try to remediate the situation by covering the intestines in strategically places gauze or cloth packs, or by having assistants hold sections of the intestines in place by hand. The tentorium, partly fixed by stitches in a segment of the abdominal incision, with a free section that wraps around the intestines to keep them out of the operatory field, allows the surgeon to have ample access into the depths of the incision.[7] Schiassi concludes the analysis of the tentorium by stating that it allows for *great incisions* followed by *great success*.

Schiassi also includes a third point, remembering that *the possibility of leaving foreign objects, such as compresses, gauze, and surgical instruments, in the abdominal cavity during an operation is not at all rare*. He recalls that famous surgeons of the era, like R. Stitch and the Italian A. Clerici, feared this very possibility. Clerici even called it, *the inevitable aspect of medicine*. In his publication, Schiassi cites the work of German surgeon H. Haberer in which he confesses to having left foreign objects on 6 occasions, *twice tweezers and four times a gauze compress in the abdomen of patients on whom he operated*.[8]

The reasons for which such fatal errors may occur are: i) *hemorrhage that significantly alters how the operating field looks and that require hurried cleaning and use of multiple compresses and absorbant materials*... which result in a compress being pushed into the depth of the incision and forgotten. *Two such cases are cited, one by Chaput during an ectopic pregnancy with a large hemorrhage, and one by Haberer, during an ovarian carcinoma surgery that also resulted in substantial hemorrhage*.[7]

Schiassi cites the following as another reason: ii) *The unexpected and sudden poor health of the patient that requires immediate termination of surgery. In a case of imminent death, Haberer was forced to quickly close the abdominal incision and abandon tweezers inside*.

A third reason for such oversights could be: iii) *Sudden vomiting that causes intestinal loops to project into the operating field. It is then far too easy for tweezers or gauze to shift, hidden amongst the intestinal loops, and then moved back out of the operational field away from the view of the surgeon*. According to Schiassi, *the tentorium seems to be the best instrument to guarantee that no oversight, such as a forgotten piece of gauze or pair of tweezers, is left in the patient*.

Concluding the article, Schiassi writes: ... *during such operations I believe that it is paramount for surgeons to: 1) have an ample point of access, 2) a defense against microbial infection, and 3) a secure preventative measure for forgotten instruments in the cavity, such as those described by Haberer*.

Particularly interesting is Schiassi's focus on defense against microbial contamination. This was particularly common and dangerous in operations that allowed for bacteria from the uterus and other annexes to enter the peritoneal cavity, and for operations involving the bile ducts. Schiassi cites Korte in the following phrase, used in a surgery essay curated by V.R. Stich and Makkas: *in no other operation in the abdomen do I suggest more generous application of protective compresses than for operations on the bile ducts*.[9]

The defense of the operating field against microbes was an important objective for all advanced surgeons in the early 1900s. *Haberer, like the rest of the surgeons operating on bile ducts at the time, placed special attention on the cleanliness of the operating field, as such operations can lead to peritonitis, which is one of the leading causes of death*.[7]

Regarding the third point of the importance of preventative measures, Schiassi cites the work of Clifford White. White compiled 44 cases, mostly of gynecological operations, in which gauze or surgical instruments were left in the abdomen, due to a lack of preventative attention. Schiassi points out a specific case, in which Professor Dr. D'Antona forgot a piece of gauze during a bile duct operation. The danger of such operations was also noted by the surgeon Neugebauer, who, with Haberer, compiled a history of 195 cases in which one had to re-operate to remove gauze or tweezers forgotten in the abdomen.[7]

Conclusions

In conclusion, Schiassi suggested that the use of the tentorium should not be limited, *to operations on the abdomen, but also be used in those on other cavities: such as the pleural cavity, pericardium, renal cavity,* etc.

Schiassi adds that, *the time it takes to place and stabilize the tentorium with stitches equals the time it would take to create small dams and spaces with many pieces of gauze*.[7]

Schiassi urges his readers to remember that, *although for some colleagues this apparatus may seem like a mere technicality in operational procedure, the tentorium has great potential and importance to all surgeons, despite statements made by A. Clerici*.

In its simplicity, Schiassi's tentorium had the potential to overcome one of the main risks at the beginning of modern surgery. Thanks to the introduction of anesthesia, surgeons could now operate in places that were previously inaccessible, such as the abdomen, pelvis, and chest. However, this increased access also meant increased invasiveness of operations, opening the door to more infections and a greater likelihood of forgotten gauze and surgical instruments in deep cavities.

As a doctor and scientist, Benedetto Schiassi was able to harmoniously link good practical sense, cultivated at the patient's bedside and in the operating room, with logical reasoning and humanistic science, resulting in an admirable example for the modern medical world.

Doctors of today are often confused with the latest technology, innovation, and gadgets that they forget that a focus on the patient, and his or her needs, leads to the most rational solutions. Operations should combine what modern technology offers with clinical, empirically observable methods used by the founders of surgery.

As the 12th century French philosopher Bernard of Chartres said: *We are like dwarves on the shoulders of giants, whom can see more and see farther, certainly not due to our own height, but because we are held up and carried on high by the stature of giants*.[10]

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