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The great oncologic surgery of the eminent Romanian anatomist and surgeon Thomas Jonnesco (1860-1929)

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Summary

Thomas Jonnesco was an eminent Romanian surgeon and anatomist. Politician and patriot, he was founder of the modern Romanian experimental surgery and initiator of general rachianaesthesia. Among his scientific works we underline his contribution to the field of oncology since he established new original surgical methods for the treatment of cancer.

Key words: anatomist, cervical sympathectomy, general rachianaesthesia, original great surgery of cancer, surgeon, Thomas Jonnesco

Life and career

Thomas Jonnesco (Ionescu) (Photo 1) was born in Ploesti (Romania) in 1860. After having completed his secondary education in Bucharest in 1878 he went to Paris where he enrolled in the School of Medicine. In 1879, he enrolled in the Law School and started attending both Schools at the same time. However, in 1882 he obtained his degree and left the Law School for Medicine. In 1889, he gained the French nationality in order to be able to participate in the aggregation. In 1890, he received the second prize in a competition for surgeons and his dissertation on the *Hernies internes rétropéritonéales* [1] was granted the Laborie award by the Paris Academy of Medicine. The Greek professor Photinos Panas (1862) and Jonnesco (1892) were the only non French people to have been granted that famous award. In 1892, he gained his doctorate in medicine by presenting his thesis *Sur l'évolution intra-utérine du colon pelvien* [2]. In 1894, he gained the title of professor of anatomy. In the same year he was selected by the professors Poirier, Charpy and Nicolas to be their collaborator in a very important work on anatomy, the most important up to that point in France [3]. In 1895, he returned to Bucharest in order to lead the Institute of Topographic Anatomy and Experimental Surgery that was especially created for him. He also accepted the Chair of the Surgery Clinic of Coltzea Hospital [4]. The first important thing that



Photo 1. Thomas Jonnesco in 1925.

was established since he took over the Chair was the introduction of strict asepsis and the systematic prohibition of antisepsis that was standard procedure in all the services in Bucharest, an old habit against which Jonnesco gave a true fight. In order to make his activities and those of his collaborators known to the public he founded in 1896 in Paris the Journal *Archives des Sciences Médicales* and in Bucharest he published the *Revista de Chirurgie*. Moreover, he exercised the activities of Dean of the Faculty of Medicine and Rector of the University of Bucharest [5].

Political activity

Jonnesco was elected Member of the Parliament for 2 terms and senator for 4 terms. He was member of the *Action Nationale*, the main goal of which was the collaboration of the country with the *Triple Entente*. During the First World War (1914-1918) he returned to Paris in order to defend the right demands of Romania. Actually he published in Paris a study in 2 volumes entitled *La Question Roumaine* [6] which aimed at announcing to the French public the claims of his country, its history and its current state. He was member of the National Committee in Romania, founded in Paris in 1918, with a mission to defend the interests of Romania towards the allied nations, given the fact that since Romania had made peace treaty with Germany then it was impossible to have relations with the old allies. This Committee that was recognized by England, France, and Italy was of great service to Romania. In 1920, Jonnesco became the first Romanian delegate in the Society of Nations and he had the honor of being elected President of the sector of Economy and Finances.

Scientific works

The majority of Jonnesco's works completed in Paris were works on anatomy. He was attracted to the study of the abdominal cavity and especially to the study of peritoneum which, at that time, was considered to be unclear. From 1889 until 1894 he discovered many still obscure sites of the abdominal cavity: the duodenum with its peritoneal dimples, the sigmoid loop which he named pelvic colon, a name that since then was universally adopted. The fossae of the caecum and the appendix were his discoveries, as they were those of the stomach and its ligaments etc. In 1894, in the important *Traité d'Anatomie humaine* published by Poirier, he published the 1st part of the 4th volume entitled *Anatomie du tube digestif* [7], which was his most important work on anatomy. In addition to these works on anatomy he also published in Paris, in 1890, a book entitled *Anatomie de la région duodénale in hernies internes rétro-péritonéales*, which was credited by the Paris Academy of Medicine. Besides these great scientific works, Jonnesco manifested many other works both on anatomy and surgery that complete his activities in France.

Once he returned to his homeland, Jonnesco started to rigorously work both in the clinical and in the experimental fields. His first goal was to replace the antisepsis that constituted a dominant method in the surgical practice up to that point in Romania, with strict asepsis. Among the subjects that preoccupied him scientifically were the general spinal anesthesia, the surgery of the cervical part of the sympathetic system and the major gynecological surgery. In the Congress of Gynecology, Obstetrics and Pediatrics that was held in Marseilles in 1898, he made an announcement on the total abdominal genital ablation for the treatment of septic lesions of the uterus [8]. In the International Congress of Medicine held in Paris in 1900, he made announcements on total abdominal genital ablation [9], on the resection of the rectum and of the pelvic colon [10], and a last one on the ablation of tumors of the optic nerve while keeping the eyeball [11]. In the International Congress of Gynecology held in Rome in 1902, within the framework of a report made on the treatment of cancer of the uterus by means of surgical operation, Jonnesco described the process of total abdominal genital ablation [12] with lumbo-ilio-pelvic excision of the parametria and the pelvic, iliac and lumbar lymph nodes (unlike the operation of Wertheim who only excised lymph nodes in the periphery of the uterus). The details of these operations were then reiterated in the *New York Medical Journal* (1910).

The great oncologic surgery of Jonnesco

Since 1896, Jonnesco was a passionate defender of the abdominal hysterectomy and went against the current trend of the time which directed only to vaginal hysterectomy or to the combined abdomino-vaginal hysterectomy.

It was in 1897, in the International Congress of Medicine in Moscow, that Jonnesco defended the superiority of total abdominal genital ablation for the septic lesions of the uterus and described the procedure that he followed. In all congresses that followed Jonnesco made several reports on total abdominal genital ablation as treatment for septic conditions of the uterus and the adnexa. After a while he was set against limited opera-

tions for the treatment of cancer of the uterus and recommended a larger operation in the abdomen. He also described in detail the technique of this operation and the results that the patient can hope to have. He did this in the report for which he was in charge by the International Committee of Gynecology and he announced it in the Congress of Rome in 1902.

From this report it becomes obvious that from the beginning of his career through his numerous works Jonnesco had become the apostle of gynecological surgery through the abdomen and fought against all the short-sighted forces that supported the blind vaginal way.

Large abdominal hysterectomy with complete ilio-lumbo-pelvic lymph node dissection in uterine cancer

Jonnesco was in charge of a report on the surgical treatment of the uterine cancer in the 4th International Congress of Gynecology and Obstetrics held in 1902 in Rome. This report can be found *in extenso* in the *Revue de Gynécologie et de Chirurgie abdominale* [12].

The operation that Jonnesco recommends differs from all practices that were applied before his time. In reality he is not satisfied by simply performing a total abdominal hysterectomy with removal of the parametrium; he takes the operation a step further and completes it by extirpation of the lymph nodes and the fatty tissue of the pelvis, even of the lumbar region. According to him this is the only way to avoid disease recurrence in the proximal and distant lymph nodes [13].

Jonnesco reaches this conclusion after performing systematic examination of lymph nodes that have been removed, as well as of the cancerous uterus. These examinations were realized in his laboratory by his assistants Bruckner and Mezincesco. In 13 cases examined, 8 (61.5%) of them were with cancerous lymph nodes and 5 were cancer-free even though they were enlarged. It was interesting to know the distribution of the cancerous lymph nodes in order to justify the extent for the extirpation that was needed. Below is this distribution: in one case, of 10 examined lymph nodes 6 were cancerous; in another case, of 11 examined lymph nodes 6 of them were cancerous; in another one, 6 cancerous lymph nodes were identified in 10 examined lymph nodes; in 3 cases all of the examined lymph nodes were cancerous; in one case, the hypogastric lymph nodes were cancerous, the external iliac lymph nodes showed hypertrophy but did not include any element of neoplasia, while the lumbo-aortic lymph nodes were cancerous. In one case, where the parametrium showed numerous cancerous nodules and lymphatics full of cancer cells with high mitotic activity, the lymph nodes, even those that were closer to the neoplastic masses, were not infiltrated by cancer. These histological results show that the neoplastic nature of the lymph nodes is not related neither to their volume nor to their location, i.e. how close they are to the diseased uterus. Even more, in 8 cases of cancerous lymph nodes, 5 were in cancers limited in the uterine cervix without signs of invasion to the parametrium and 3 with limited infiltration of the parametrium.

The size of the lymph nodes was not directly linked to their current state. The larger lymph nodes were not cancerous whereas the smaller ones that were hardly identifiable contained neoplastic cells. However, neither the clinical examination performed prior to the operation, nor the physical examination after the opening of the abdomen, not even the direct palpation gave useful information over the state of the lymph nodes. In most cases, it was only the microscope that could determine the exact state of the lymph nodes.

Jonnesco summarized in the following way the important issue of the extension of the surgical intervention in the uterine cancer: 1) the invasion of the lymph nodes is frequent since he identified it in 61.5% of the cases; 2) the lymph nodes can be invaded by early cancer without any infiltration of the parametrium; 3) even the case of cancerous infiltration of the parametrium does not imply invasion of the lymph nodes by the neoplasm; 4) the invasion of the lymph nodes can be preceded by cancerous thrombosis of vessels and of peri-uterine lymphatic spaces. This thrombosis can also exist without infiltration of the parametrium and even without degeneration of the lymph nodes; 5) the size of the lymph nodes is not directly related to their invasion by the neoplasm; 6) there are no regular stages in the course of the invasion of the lymph nodes: the distant lymph nodes can manifest degeneration while the proximal are undamaged; 7) the location, the extension and the clinical form of cancer of the cervix uteri have no direct relation with the invasion of lymph nodes. A minimal cancer of the intravaginal or the supravaginal portion of the cervix can be accompanied by nodal involvement, while huge vegetating tumors of the vaginal portion of the cervix may manifest zero effects in the lymph nodes; 8) given the uncertainty concerning the existence or not of a parametrial or lymphatic invasion both from the clinical point of view and after clinical examination, we conclude that the only rational operation for the cases of operable uterine cancer is its surgical extirpation through the abdomen with complete ilio-lumbo-pelvic node dissection.

After having shown that the operation, as de-

scribed by Wertheim, is incomplete, since it deals only with the parametrium and with the lymph nodes of close proximity, Jonnesco gives an account of his own technique which is undoubtedly a more rational surgical operation [14]:

The operation includes the following steps: 1) Laparotomy; 2) Isolation of the adnexa. Dissection of the infundibulo-pelvic and round ligaments. Dissection of large ligaments; 3) Ligature of the hypogastric arteries; 4) Detachment of the bladder; 5) Dissection of the ureters. Dissection of the uterine artery; 6) Incision of Douglas space. Section of the utero-recto-sacral ligaments. Utero-vagino-rectal detachment; 7) Amputation of the vagina; 8) Dissection and extirpation of the fatty tissue of the pelvis and of the iliac fossa and of all the lumbar lymphatic vessels and the lymph nodes they contain; 9) Drainage of the pelvis through the vagina; 10) Peritonisation; 11) Closure of the abdomen.

Results

Below are the surgical results of Jonnesco until the announcement of his report in the Congress of Rome. From 1898 to 1902 he had performed 38 radical interventions through the abdomen out of which: from 1898 to 1899, 10 radical abdominal hysterectomies (3 patients died); from 1899 to 1900 10 total removals for cancers that were very large in size and with infiltrated lymph nodes, that he actually considered inoperable (6 patients died); from 1900 to 1902, 18 total hysterectomies out of which 2 were for chorioepithelioma (3 patients died); in the 8 cases with advanced cancer 3 patients died, while no death occurred in the remaining 10 cases with limited cancer.

These results prove that the mortality rate of surgical operations is directly linked to the selection of cases themselves and to the skill that Jonnesco had acquired. In the beginning, Jonnesco performed surgery for all the cases that were clinically and technically operable. These operations lasted long many times, were complicated, shocking and the results themselves were not good. In time, however, he abandoned these cases and limited his interventions to cases where the operation was easy and quick and where patients where in good general health. In those cases the results were excellent and the mortality rate zero.

The long-term results from the surgical treatment of cancer of the uterus were presented by Jonnesco in the Congress of the International Association of Surgery in 1908. His overall results in 10 years (from 1897 to 1908) included 119 operations where 88 patients were treated successfully and 31 died (mortality rate 25%). Between 1899 and 1908, out of 210 cases operated without any removals 81 patients were treated successfully and 29 died; therefore the mortality was a little more than 26%.

Out of 81 successful treatments, 62 patients were lost to follow-up and the remaining 19 were followed-up with the following results: 14 patients without disease relapse, out of which one operated 10 years ago, one 7 years ago, one 6.5 years, one 6 years and 2 months, one 5.5 years, two 2 years and 7 months, three 2 years and 4 months, one 2 years and 2 months, and one 1 year and 5 months. There were also 5 cases with recurrence after 2 years, 1 year, and 11, 7 and 6 months.

In this announcement Jonnesco insists on the state of lymph nodes extirpated by this major intervention. Since he started performing the large ilio-lumbo-pelvic excision (1899), the extirpated lymph nodes were examined in the laboratory by his assistants in 49 cases.

The location and size of the lymph nodes were not an indication of their pathological state. In certain cases the lymph nodes of the low-situated group (group of the bifurcation of the iliac vessels and the obdurator nerve) were normal, whereas the lymph nodes of the higher-situated group (group of the external iliac, the common iliac and the paraaortic group) were cancerous and *vice versa*. Also identified were enlarged lymph nodes or lymph nodes that were only hypertrophic but normal on palpation, while others that were detectable with difficulty for direct examination had already been invaded by cancer.

These observations justify the major operation proposed by Jonnesco in the Congress in Rome that he practised until the end of his career with only minor modifications of the technique.

The author concludes that cancer of the uterus is surgically treated in two conditions: 1) in the case that the neoplasm is still limited which enables easy and total removal of the uterus, adnexa and parametrium; 2) in the case that the radical abdominal hysterectomy is followed by evacuation of the pelvis and the iliac fossa, meaning dissection of the vessels, nerves, muscles, fatty tissue, as well as the lymph nodes that the pelvis contains. This dissection must be continued until the most profound nests like sacro-rectal and lumbo-sacral. This dissection is neither difficult nor delicate. In fact it does not make the operative procedure very long whereas the duration can be reduced to one hour. Jonnesco adds that the resection of certain hypertrophic lymph nodes that are visible is an operation that is wrongfully called pelvic evacuation because it has not surgical meaning and has no reason of existence. According to him there are only two surgical procedures: one is limited and consists in the hysterectomy that is followed by resection of the parametrium; the other

one is large and consists in the removal of the uterus, the adnexa, the fatty tissue, the iliac and lumbar fossa with the lymph nodes included. The more limited the cancer the larger the operation must be in order to be effective. The palliative treatment (curettage and ligatures) must be abandoned for cancer of the uterus that has infiltrated the parametrium (Photo 2).

Surgical technique of gastrectomy for cancer

Gastrectomy can be either total or partial; total gastrectomy even though it was been tried it must be avoided. Partial gastrectomy can be typical or atypical [15]. Typical gastrectomy consists in the extirpation of the cancerous pylorus and in the anastomosis of the duodenum with the stomach [16]. Atypical gastrectomy consists in the resection of one segment of the wall or curved regions of the stomach [17].

Pylorectomy is performed in 7 steps: 1) laparotomy; 2) exploration of the tumor and the neighboring regions; 3) isolation and removal of the tumor from the abdomen (dissection of the normal or abnormal adherences, extirpation of the tumefied or degenerated lymph nodes); 4) pylorectomy; 5) gastroraphy and gastro-duodenoraphy; 6) repositioning of the viscera; 7) closure of the abdominal cavity.

Having reviewed every step of the operation, Jonnesco describes the operation that gave him the best results after numerous experiments with cadavers.

At the end he studies the operation of Billroth, pylorectomy combined with gastroenterostomy, and the atypical partial gastrectomy [18].

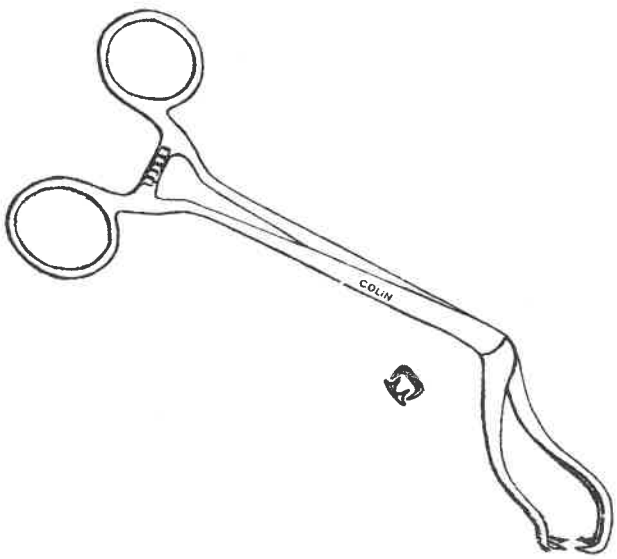


Photo 2. Forceps Jonnesco-type to grasp the neck of uterus.

Extirpation of tumors of the optic nerve

It concerns a surgical process which, thanks to a temporary resection of the external wall of the orbit, enables the extirpation of tumors of the optic nerve while maintaining the eyeball. Below is the description given by Jonnesco himself during the International Congress of Medical Sciences in Paris in 1900.

Maintaining the eyeball offers a double advantage: first of all an aesthetic advantage since the eyeball keeps its integrity; then there is a functional advantage since it facilitates prosthesis in case the eyeball has atrophied. The procedure of Jonnesco in fact derives from the operation of Krönlein and can be resumed in the following way: 1) cutaneous incision; 2) mobilization of the flap; 3) exploration of the orbital cavity; denudation, mobilization and extirpation of the tumor; 4) remaking of the orbit; 5) suture of the skin.

The author reports two cases of tumors of the optic nerve operated by this method: in the first case a fibroma with colloidal degeneration that had completely destroyed the optic nerve; in the second case an encapsulated tumor, a myxoma of the optic nerve.

Discussion

All who had started their activities in the same time as Jonnesco, remember this student, this person who worked without showing signs of exhaustion, who read everything, who knew everything and who, despite his difficulty in oral speech -that he didn't overcome at any point in his life- he managed to gain great distinctions through hard work. On the day of his appointment he was seen in the Faculty of Paris having his eyes full of tears of happiness for that moment of triumph. Then he decided to return to his country, where in a very short time, thanks to his great value and social status, he managed to reach first place and create a remarkable school impregnated with the French spirit. However, Jonnesco felt nostalgic of France, of the same France that formed him, that accommodated him and treated him as her intellectual son; that is why he visited France often. Until the war he never missed a congress on surgery held in France. By the end of the war taken down by his poor health, he visited France less often. Two months before his death he went to the annual French Congress. He really loved surgery. He took great satisfaction from delicate surgical interventions, both in the cervical part of the sympathetic system and gynecological operations on cancers and he managed to make perfect surgical operations. His deep knowledge of anatomy sometimes took him too far and in 1901, in the Congress in Rome,

he found himself in a conflict with his colleagues in relation to the extirpation of lumbar lymph nodes in cancer of the uterus. However, this exaggerated event shows the nature of tendencies at the time as well as the nice surgical qualities that enabled Jonnesco to engage in many operations (Photo 3). He was one of the most ardent advocates of spinal anesthesia and he never stopped talking about it (Photo 4).

The name of Jonnesco is related to: *a) Needle of Jonnesco*: Needle for the binding of the patella; *b) Anesthesia of Jonnesco* [19,20] (Photo 5); *c) Colon ligaments of Jonnesco* or *Long bands of the colon*; *d) Operation of Jonnesco*: 1) surgical treatment of the angina pectoris that consisted in the resection of the chain of the cervical part of the sympathetic system and of the first thoracic lymph node [21]; 2) technique of total hysterectomy that included in a first time the isolated ablation of the adnexa uteri; 3) technique of cervical sympathectomy by means of ablation of the 3 sympathetic lymph nodes, recommended as treatment for the resistant angina [22]; *e) Vestibule of Faure and Jonnesco* or *prevestibular funnel*: inconstant lengthening of the vestibular of the back cavity of the omentum at the right side of the hiatus of Winslow; *f) Nephropexy of Jonnesco*: he imagined an individual procedure of nephropexy that was totally different from all other previous procedures.



Photo 3. Medal with the portrait of Jonnesco given to him by his students in 1908.



Photo 4. On the back side of the medal, Jonnesco practising the spinal anesthesia.



Photo 5. Cervico-dorsal punction to lateral décubitus.

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