

Research Article - History of Anatomy and Embryology

Surgical anatomy for the treatment of ocular cancer by Antonio Scarpa (1752-1832)

Marilita M. Moschos, MD, PhD

1st Department of Ophthalmology, Medical School, University of Athens; Biomedical Research Foundation, Academy of Athens, Greece

Abstract

Antonio Scarpa (1752-1832) (Fig.1) was one of the most famous anatomists during the second half of 18th and the early 19th century, being a professor of anatomy at the Universities of Modena and Pavia. He is considered as the "Father of Italian ophthalmology", because he wrote the first study for ocular diseases in Italian. His studies on ocular cancer did not offer only a detailed analysis of the disease but also a description of a unique surgical technique for its treatment based on the surgical and clinical anatomy of this disease.

Key words

Antonio Scarpa, ocular cancer, clinical anatomy, surgical anatomy.

Introduction

Antonio Scarpa (1752-1832; a portrait is in the public domain at: https://it.wikipedia.org/wiki/Antonio_Scarpa) was one of the most famous anatomists during the second half of 18th and the early 19th century. He was professor of anatomy at the Universities of Modena and Pavia (Monti, 1957). He is considered as the "Father of Italian ophthalmology" (Grzybowski, 2014), because he wrote the first study for ocular diseases in Italian. In the 5th edition of this study entitled: *Trattato delle principali malattie degli occhi* (Treatise on principal diseases of the eyes) there is a detailed analysis not only of ocular cancer but also of its surgical treatment, which was total extirpation of the eye (Scarpa, 1816).

Antonio Scarpa's on ocular cancer

Scarpa felt the necessity to write a review of ocular cancer because no one before him made a similar one and in medical literature of his time there was not a study on ocular cancer which could be used as standard reference updated with the new knowledge on ocular cancer, where a physician could be informed about the characteristics of ocular cancer and its surgical treatment in order to facilitate the diagnosis and to offer an efficacious treatment (Scarpa, 1816).

Few of Scarpa's contemporaries tried to examine in detail ocular cancer, although the majority of them were interested in its surgical treatment. But they failed to

* Corresponding author. E-mail: moschosmarilita@yahoo.fr

present a complete analysis on the theme as Scarpa did. Only Scarpa managed to be more specific in the anatomical appearance of the disease. He succeeded in this because he was an anatomist. Scarpa was able to present a more precise analysis of the types of ocular cancer because he combined the anatomical structure of the eye with the development and characteristics of cancer. Therefore he recognized two basic types of ocular cancer, the one hard in substance presented in the anterior anatomical structures of the eye and mainly in adults and the second soft in substance which presented in the posterior anatomical structures of the eye, mainly retina and ocular nerve, and which presented in children (Scarpa, 1816). The first one was named Carcinoma (Hirschberg, 1899) and the second Fungus haematodes, which was the name at that time of Retinoblastoma (Dunphy, 1964; Albert, 1987).

Apart from his clinical observations on ocular cancer he developed a technique for its surgical treatment (total extirpation) applied to both types of cancer, which was based on the anatomy of the eye and no other before him had indicate a similar one (Wood, 1911).

Scarpa advised that the surgeon should pay attention to the anatomical structures, should do everything possible, in order the patient to experience less pain and should complete the operation as quick as possible. To perform the surgery of total extirpation, Antonio Scarpa proposed the surgeon hold ocular tumor by the index and middle finger and using a convex lancet to prepare the ligaments connecting the conjunctiva with the upper eyelid in order to ablate them, enter the conjunctiva from the outer canthus and cut the levator of the eyelid, the tendon of the superior oblique and eyebrow nerves. Because the maneuver to cut the levator of the eyelid poses risks if the scalpel is not near the orbit, it was advised that the surgeon should use his index to gripe this muscle and then cut it. The same maneuver should be applied to the lower part of the eye, in order to cut the tendon of the inferior oblique without the eyeball being reposed in the orbit. Then, since the eyeball is mobile, the surgeon should place his finger behind the eyeball, so it be used as a guide for the curved scissors to be introduced to excise the ocular muscles and ocular nerve. The surgeon should hold in his palm the mined eyeball and using again the curved scissors should excise the anatomical structures entering the orbit from the superior orbital fissure, in order to complete the operation. Antonio Scarpa underlined also that the surgeon should avoid leaving residual cancerous tissue and should use his finger to find the inferior oblique and to extirpate the lacrimal gland. He also proposed that the artificial eye which to be placed in the orbit should have a conical tip making its fixation there easy (Scarpa, 1816).

Conclusion

The value of Scarpas' technique lays on the fact that for the first time the author focused on the significance of surgical anatomy for the success of extirpation of eyeball (Haab, 1904). In addition, he noticed also the importance of not leaving any cancerous tissue in the orbit for the survival of the patient. He improved the earlier but brutal techniques of total extirpation of Georg Bartisch (1535-1607) (Bartisch, 1583), Wilhelm Fabricius von Hilden (1560-1634) (Fabricius Von Hilden, 1682) and also Antoine Louis (1723-1792) (Guérin, 1769) and was a forerunner for the technique of

Joseph O' Ferall (1798/99-1868) and Amédée Bonnet (1809-1858) known as Ferall - Bonnet technique which was very popular during the second half of 19th and early 20th century (Beard, 1910).

Conflict of Interest

The author declares that there is no conflict of interest.

References

- Albert D.M. (1987) Historic review of retinoblastoma. *Ophthalmology* 94: 654-662.
- Bartisch G. (1583) *Ophthalmoduleia, das ist Augendienst: neuer und wolgegründter Bericht von Ursachen und Erkenntnis aller Gebrechen Schaden und Mängel der Augen und des Gesichtes*. Stöckel, Dreszden.
- Beard C.H. (1910) *Ophthalmic Surgery; A Treatise on Surgical Operations Pertaining to the Eye and Its Appendages, with Chapters on Para-operative Technic and Management of Instruments*. P. Blakiston's Son & Co., Philadelphia.
- Dunphy E.B. (1964) The story of retinoblastoma. *Trans. Am. Acad. Ophthalmol. Otolaryngol.* 68: 249-264.
- Fabricius Von Hilden W.(1682) *Guilielmi Fabricii Hildani Paterniacensis Chirurgi Ordinarii Observationum et Curationum Chirurgicarum Centuria*. Typis ac sumptibus B.C., Wustii Jun Francofurti ad Moenum.
- Guérin P. (1769) *Traité Sur les Maladies des Yeux*. Chez V. Reguilliat, Lyon.
- Grzybowski A. (2014) Antonio Scarpa (1752-1832): father of Italian ophthalmology. *Eur. J. Ophthalmol.* 24, 469-475.
- Haab O. (1904) *Atlas und Grundriss der Lehre von den Augenoperationen*. Lehmann, München.
- Hirschberg J. (1899) *Geschichte der Augenheilkunde*. 1 Handbuch der gesamten Augenheilkunde. Bd. 12 Geschichte der Augenheilkunde im Alterthum. Engelmann, Leipzig.
- Monti A. (1957) *Antonio Scarpa in Scientific History and His Role in the Fortunes of the University of Pavia*. Vigo Press, New York.
- Scarpa A. (1816) *Trattato delle Principali Malattie degli Occhi*. I-II. Nella stamperia di Pietro Bizzoni, Pavia.
- Wood C.A. (1911) *A System of Ophthalmic Operations*. Vol. I-II. Cleveland Press, Chicago.