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Castrati singers: surgery for religion and art

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Abstract

The act of castration was practiced from ancient times. In countries of Middle and Far East, castration was often done to provide eunuchs as guardians of the harems. In Europe and especially in Italy, it was carried out to preserve the male voice unbroken into adult life. From 16th century till the end of 18th century, castrati singers dominated opera with their supernatural voices. Boys were castrated mainly before the age of 9 years and when they grew up they had feminine characteristics, such as smooth, hairless bodies, breasts, infantile penis. The training procedure to become a castrato singer was very intense and lasted up to ten years. The most common surgical technique was either to sever the spermatic cords or crush the testis with the fingers. The voice of a castrato was the outcome of a larynx the size of a child's combined with the lung volume of an adult male. The castrati singers became superstars who dominated opera, singing both male and female roles for more than 200 years. Castrated for art, the beauty, range and flexibility of their voices raised them to mythical status.

Key words

Castrati singers, eunuchism, history of surgery, history of music.

Introduction

The practice of castration to preserve the high pitch voice of a boy is surrounded by mystery. The beginning of castrati singers in Western Europe probably came from the Church of Rome in the later 16th century. The evolution of polyphonic church music required high pitch voices. Because women were forbidden to participate in choirs, it was necessary to use substitutes of the female voice, such as children and male falsettists. This prohibition was based on the words of the Apostle St. Paul: "*mulier taceat in ecclesia* - let your women keep silence in the churches; for it is not permitted unto them to speak" (1 Corinthians, chapter 14, verse 34). The facts that boy voice soon changed and lacked power and the inferior, artificial quality of sound of the falsettists, soon led to the rise of castrati who rapidly became members of all the main choirs of Italy.

An additional cause for castrati appearance was the florescence of the opera in Italy. The opening of public opera houses provided centers of entertainment for the general population. The first public opera was opened in Venice in 1637. Soon there were also performances in Germany, France, Poland, Sweden and England. The rise of the

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castrati was in parallel with the popularity of opera, reaching its peak in the middle of the 18th century. Even when women were allowed on stage, the public preferred the sound of the high pitch male voice.

The castrato voice

The increasing amounts of the male hormones testosterone and its metabolite dihydrotestosterone lead the vocal cords grow in length to about 17-35 mm. The normal male hormone activity transforms the vocal cords producing oedema and then thickening (Goldman and Salmon, 1942). During the formation of the larynx, the length of the thyroid cartilage increases, mainly in the male, which results in the so-called "Adam's apple" (Kahane, 1982). The male larynx has specific receptors for testosterone and dihydrotestosterone (Tuohimaa et al., 1981). Under the influence of growth hormones, of other growth factors and of the genetic influence of X and Y chromosomes (Buhler, 1980; Ballabio et al., 1989), growth of the larynx is accompanied by that of the pharynx, the oral cavity and the thoracic cavity. The consequence of this enlargement of the upper respiratory system is the power of the voice of an adult compared with a childish voice.

Castration prevents the typical male development of the larynx. Although a castrato larynx remains undeveloped the whole organism follows the natural evolution, with consequences on the voice quality.

Descriptions given by numerous contemporaries of that time give us an idea of how the castrati's voices really sounded. Some authors report that they had a male timbre, some others compare them to a deep female voice (Deuster, 2006). Alessandro Moreschi (1858-1922) was the last castrato in the Vatican. Moreschi was the most lucky of all the castrati, because he achieved to save his unique voice by recording it in a series of records from 1902 to 1904 (Clapton, 2004; Deuster, 2006). Unfortunately, the chosen selections do not portray the power of a castrato voice. The custom of castration was finally concluded in 1903 by the famous "motu proprio", with which Pope Pius X (1835-1914) reformed the religious music and forbade the use of "sopranist" or "castrati", and by the death of the above mentioned Moreschi in 1922 (Musitelli and Felderhof, 2003).

The castrato appearance

The physical appearance of the castrati was also special. They were tall, something that was unusual in the 18th century. This is shown in many of the caricatures, which were drawn of them. A probable reason for this phenomenon was the lack of testosterone resulting on delayed closure of the epiphyses. The secondary male sexual signs were missing and the castrati had a fat distribution more like a female, giving them a pseudo-feminine appearance. They were beardless with luxuriant scalp hair. Gynecomastia was at times prominent, they were wide hipped and a few had steatopygia (Ancillon, 1707, 1718; Burney, 1789; Jenkins, 2000). They also had so-called keel chest (pectus carinatum), with expansion of the rib-cage, leaving more space for development of the lungs.

Nowadays, we can only speculate on how these androgynic figures really felt, both physically and emotionally. We know from various studies that the major sexual effects of castration are the loss of libido, hot flashes and genital shrinkage (Buvat et al., 2010), as well as premature aging and forms of senile melancholia in still relatively young individuals.

Surgical techniques and centers

In the late 1500's, young castrates began to be heard with voices ideal for soprano parts. This effect was discovered, perhaps accidentally, after bilateral orchiectomy incidental to bilaretal herniotomy on children as practiced by the barber-surgeons (Stromayr, 1559; Melicow and Pulrang, 1974; Melicow, 1977). The news of such an outcome must have spread, but it is not known when the practice became widespread. In spite of the fact that the Church forbade castration, there seemed to be a compromise for the sake of ecclesiestical music. In 1599 two young castrati, Pietro Folignato and Girolamo Rossini, were the first to be admitted to the Sistine Chapel Choir (Ancillon, 1707, 1718; Habock, 1927; Heriot, 1956; Musitelli and Felderhof, 2003). The castration custom was especially favored by Pope Clement VIII (1535-1605 AD), as voices for the "heavenly choirs" of the Sistine Chapel were needed from boys, because females were not allowed in. The production of castrati took place mainly in Italy. Bologna, Lecce and Norcia became centers for this operation. Their surgeons became well known and were called to many capitals in Europe (Burney, 1771, 1789; Habock, 1927).

Castration was performed between the age of 6 and 9 years. Because it was a forbidden practice, we do not have a detailed description of the procedure. The most common techniques was to sever the spermatic cords, so that the testis simply atrophied. Another more painful method was to crush the testes with the fingers.

One of the few descriptions to survive is that of Ancillon: "The boy, five to seven years of age, was placed in a hot bath, to soften and make supple the parts, making them more tractable. He was given a potent drink, the jugular veins were compressed and when he became groggy the organs were snipped out with a knife with scarcely any pain. In the very young constant compression and rubbing of the tiny gonads were done until they were no longer palpable" (Ancillon, 1718; Heriot, 1956; Sitwell, 1967).

It is not possible to get accurate information about those who carried out the operation, but in view of the large number of castrations during the 18th century (about 4000 each year: Habock, 1927), it is likely that as well as surgeons, practitioners such as village barbers were involved. There is no evidence to indicate what percentage of the boys did not survive the procedure.

In 1910 Napoleone Burdizzo, an Italian surgeon, introduced a clamp which still carries his name. it consists of a pair of pincers with a strong compound leverage action. He used it to crush the spermatic cord (one side at a time) without cutting into the scrotum. The procedure results in testicular atrophy after about 40 days (Melicow and Pulrang, 1974). A similar crushing implement may have been used by barber-surgeons during the castrato period.

Training of the castrati singers

The majority of the boys came from poor background, as their families hoped that the operation would open the door of an artistic career for their children.

Once castrarted, the young boys were sent to conservatories. The young castrato went through a prolonged, intensive voice training lasting up to 10 years under world famous music masters, such as Porpora, Bernacchi and Pistocchi. At the "Conservatorio di Sant' Onofrio" in Napoli, during the 1780's, the work schedule was as follows. In the morning, one hour singing difficult passages, one hour of literature, and one hour of solfeggi in front of mirrors. In the afternoon, one half hour of music theory, one half hour of counterpoint on improvisation and one hour of literature. They also had to study composition and learn to play the harpsichord.

Due to the extremely strenuous vocal exercises, the castrato boy acquired an abnormal lung capacity, which had a direct impact on his ability to hold his breath for a long time, and on the power of his tone. This exceptional mastery of breath control and breathing power, combined with training, was responsible for the flexibility, the agility, the wide range and the ease of legato. Some of them had a range of four octaves, up to "a" or even "c" above "high c" in full voice. They could hold a note well over a minute.

When the young castrato singer (musico) reached his 15th year, his first public appearance was arranged by his mentor. If well received, then a series of concerts in various cities took place and soon the singer became known throughout Italy. The worst scenario of all was a castrato whose voice failed (Ancillon, 1707, 1718; Burney, 1789). Very few of the thousands who attended the conservatories ended up singing opera. Unfortunately, there was no guarantee that the beautiful voice would persist into adulthood. Most of those whose voices remained ended up in church jobs. Other lost their voices completely and many found a career in the priesthood, as they were forbidden to marry.

Conclusions

The castrati singers, who had the voice of a boy soprano and the lung power of a grown man, were the super idols of their days. They must be given the credit for having introduced and developed the taste which governed the best singing of that era.

References

Ancillon C. (1707) Traité des Eunuques.

Ancillon C. (1718) Eunuchism Displayed. Curll, London.

Ballabio A., Bardoni B., Carrozzo R., Andria G., Bick D., Campbell L., Hamel B., Ferguson-Smith M.A., Gimelli G., Fraccaro M., Maraschio P., Zuffardi O., Guioli S., Camerino G. (1989) Contiguous gene syndromes due to deletions in the distal short arm of the human X chromosome. Proc. Natl. Acad. Sci. USA 86: 10001-10005.

Buhler E.M. (1980) A synopsis of the human Y chromosome. Hum. Genet. 55: 145-175.

Burney C (1771) The Present state of Music in France and Italy. T. Beket, J. Robson, G. Robinson, London.
Burney C. (1789) A General History of Music, from the Earliest Ages to the Present Period. Payne and Son, Robson and Clark, C.G.J. and J. Robinson, London.
Buvat J., Maggi M., Gooren L., Guay A.T., Kaufman J., Morgentaler A., Schulman C., Tan H.M., Torres L.O., Yassin A., Zitzmann M. (2010) Endocrine aspects of male sexual dysfunction. J. Sex. Med. 7: 1627-1656.
Clapton N. (2004) Moreschi: The angel of Rome. House, London.
Deuster C. (2006) How did the castratos sing: Historical observations. Wurzbg Mediz-inhist Mitt 25: 133-152.
Goldman J.L., Salmon U.J. (1942) The effect of androgen therapy on the voice and vocal cords of adult women. Ann. Oto. Rhinol. Laryngol. 51: 961-968.
Habock F. (1927) Die Kastraten und ihre Gesangskunst. Deutsche Verlage-Anstalt, Berlin and Leipzig.
Heriot C. (1956) The Castrati in Opera. Secker and Warburg, London.
Jenkins J.S. (2000) The lost voice: A history of the castrato. J. Pediatr. Endocrinol. Metab. 13 (6 suppl): 1503-1508.
Kahane J.C. (1982) Growth of the human prepubertal and pubertal larynx. J. Speech Hear Res. 25: 446-455.
Melicow M. M. (1977) Catration down the ages. N. Y. State J. Med. 77: 804-806.
Melicow M.M. and Pulrang S (1974) Castrati choir and opera singers. Urology 3: 663-670.
Musitelli S., Felderhof J.F. (2003) Castration from Mesopotamia to the XVI Century. De Historia Urologiae Europaeae 10: 111-134.
Sitwell S. (1967) Baroque and Rococo. Putnam's Sons, New York.
Stromayr C. (1559) Practica Copiosa. Handschrift des Schnitt- und Augenartztes C. Stromayr in Lindau am Bodensee.
Tuohimaa P.T, Kallio S, Heinijoki J. (1981) Androgen receptors in laryngeal carcinoma. Acta Oto-laryngol 91: 149-154.