

## REVIEW

# From mutilation to medication: the history of orchidectomy

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### Introduction

Castration has been performed for over 2000 years; reference to castration and orchidectomy occurs in Biblical and ancient mythological texts, and concrete evidence exists for it having been practised in ancient Rome and China. The inguinoscrotal hernia provided early surgeons with a challenge that resulted in many unnecessary orchidectomies and at the same time, some boys were being castrated to provide operatic entertainment for the nobility of the time. Over the years orchidectomy has been used to treat male aggression and, more recently, orchidectomy has been proposed as a treatment for both BPH and carcinoma of the prostate. Castration is now reserved for patients with prostate cancer and over the last 20 years, urologists have developed ways of chemically castrating the individual to avoid the need for mutilative surgery.

Various terms are used to refer to the loss of the testicles; orchidectomy means the surgical removal of a testicle, but over the years the definitions of other relevant terms have been less clear. The word castration is usually understood as meaning removal of both testicles, but it has often meant removal of the penis as well. The term eunuch is derived from two Greek words, *εὐνη* *εχων*, which literally translate as 'guardian of the bedchamber'. It is completely interchangeable with the word 'chamberlain'. A discussion of orchidectomy would be incomplete without reference to eunuchs, but it appears from biblical and Roman references that not all eunuchs actually had their testicles completely removed.

### Biblical and mythological texts

There are two references in the first five books of Moses to men with crushed testicles. The first, from *Leviticus* 21:17–21 'Speak to Aaron saying "any of your offspring... shall not come to offer... a man who is blind or lame or whose nose has no bridge or who has one limb longer than the other... or has crushed testicles"' is an injunction on men with crushed testicles (as well as other physical deformat-

ies) from entering the priestly rite. The second, in *Deuteronomy* 23:22 'A man with crushed testicles or a severed organ shall not enter into the congregation of the Lord' is interpreted by the biblical commentators as an injunction on men with crushed testicles from entering into marriage [1].

The Hebrew word 'saris', which appears 40 times in the Old Testament, is translated as eunuch or chamberlain [1]. The appearance of the word *saris* in the Hebrew bible suggests that eunuchs existed in Egypt (*Genesis* 37:36–9), the Kingdoms of Judah (*Kings* 1, 24:12) and Israel (*Chronicles* 1 28:1), Ethiopia (*Jeremiah* 38:7), Babylon (*Kings* 2, 20:18] and Persia (*Esther* 2:14). The classic role of the *saris* or eunuch was as protector of the harem and certainly in the Book of Esther (*Esther* 2:14) this was the duty of Shaasgaz, one of the king's eunuchs (Fig. 1). 'In the evening she would come, and the next morning she would return to the second harem in the custody of Shaasgaz, the king's chamberlain, guardian of the concubines'.

In the New Testament there is a reference to eunuchs in *Matthew* (19:12), which states 'There are eunuchs born that way from their mother's womb, there are eunuchs made so by men, and there are eunuchs who have made themselves that way for the sake of the kingdom of heaven'. The early Christian philosopher and head of the Christian Catechetical School, Origen (born 185 AD, died 254 AD) [2,3], castrated himself as he thought this verse from *Matthew* sanctioned his action. More recently, some patients with schizophrenia have also castrated themselves after reading the passage [4]. However, Christianity rejected castration as part of its practice, following the creed of Nicea in 325 AD [5]. In 1757, Andre Ivanov castrated himself and 13 disciples in a reaction against licentiousness and thus founded the sect of the Skoptzy in Rumania and Russia [3]. He was arrested and sent to Siberia, where he died, but the Skoptzy persisted, driven on by Kondrati Sselivanoff, a disciple of Andre Ivanov.

In both Greek and Egyptian mythology there are tales in which one of the characters is castrated. According to the legend of Atys from ancient Greece, Atys gave a vow of chastity to Cybele [6], subsequently violating his

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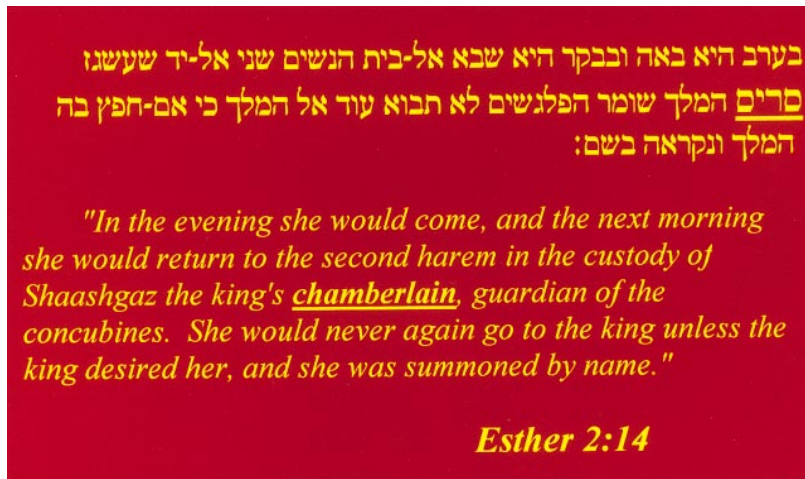


Fig. 1. Hebrew text, with the English translation, of The Book of Esther (2 : 14). The word *saris* in the Hebrew text is underlined.

chastity with a nymph and then became so wracked with guilt that in a frenzy he castrated himself. Cybele subsequently demanded that all the priests of her cult should be castrates, a practice that certainly persisted in ancient Rome. The story of Osiris and Set in Egyptian mythology is similar to the story of Chronos and Uranus in Greek mythology [2], that of a son castrating his father (Fig. 2). In the Greek story, it is said that the testicles of Uranus were thrown into the Mediterranean Sea, from the south coast of Cyprus, and out of the bloody foam that resulted from the severed testicles swilling in the water, arose Venus Aphrodite [7].

### Ancient Rome

The presence of eunuchs was well established in ancient Rome; Roman law describes several different types of eunuch, i.e. the *Thlibiae* who had their testicles pressed, the *Thladae* whose testicles were crushed, and the

*Castrati* who had their testicles (and often their penis as well) completely removed [8]. The term *Spadones* was a generic term including those defined specifically as above and congenital eunuchs.

The poets of the time recorded the presence of eunuchs [9] *'There are girls who adore unmanly eunuchs — so smooth, so beardless to kiss, and no worry about abortion ! ....let the testicles ripen and drip, fill out till they hang like two pound weights; then what the surgeon chops will hurt nobody's trade but the barber's.'* It is noteworthy that the ancient Romans clearly knew that castrates were infertile, there being no risk of pregnancy following intercourse with a eunuch. It appears that they were also aware that if castration occurred after puberty, then the castrates remained potent. This second point is also highlighted in the text below, written by Martial [10]. Martial praises his Caesar, the despot Domitian (Titus Flavius Domitianus, 51–96 AD) [10], who banned eunuchs from within his empire. *'It used to be a game to fool around with our holy marriage, a game also to mutilate*



Fig. 2. Chronos (standing) castrating his father Uranus with a diamond-studded scythe [7].

*pitiful males. Caesar, you prohibit both and so do well by future generations whom you order to be born legitimately. Now as long as you reign there will be neither eunuch nor adulterer: but before-the times! — the adulterer was a eunuch*'. By contrast, eunuchs rose to positions of considerable power under the Caesars Hadrian (Publius Aelius Hadrianus, 76–138 AD) and Caracalla (Marcus Aurelius Antoninus, 188–217 AD) [6,11]. On display in the Roman antiquities section of the British Museum in London, UK [12] is a pair of ornamental castrating tongs thought, in view of their decorative nature, to be used for ceremonial castration.

### Ancient China

At about the same time that Martial and Juvenal were writing in Rome, castration was also being performed in China. One of the most famous ancient Chinese physicians and surgeons, Hau To (110–207 AD; Fig. 3), wrote a description of how to perform castration. Hau To was eventually imprisoned by the emperor and most of his medical texts were destroyed, although his description of castration was one of his only surgical texts to be preserved [13]. Castration became one of very few surgical procedures performed in China for many years, initially for punishment and then to provide the court with eunuchs. There is a description of how the operation would have been performed, translated by Wu Lien-Teh



Fig. 3. Hau-To, Chinese surgeon and physician (110–207 AD).

in 1932 [14]. Part of the account is quoted here; '*...the patient is placed in a semi-supine position... Bandages are fastened around the hypogastric and inguinal regions ... the penis and scrotum are bathed in a hot decoction of pepper pods... ...all the parts are swiftly swept away by one stroke of a sickle-shaped knife, a pewter plug is placed in the urethra... For three days he gets nothing to drink ... The wounds generally heal in 100 days ... about 2% of all cases prove fatal...*'

The account also describes how the patient was questioned before surgery to confirm that he was sure he wished to undergo the procedure. The pewter plug was kept in place for 3 days, after which there was often a period of incontinence. This practice certainly continued until at least the late 19<sup>th</sup> century (Fig. 4).

### Herniorraphy and the Castrati singers

Guy De Chauliac (1300–1368) wrote in his book *Chirurgia Magna* [16]; '*A satisfactory herniotomy cannot be performed without castration*'. This attitude prevailed throughout Europe for a few hundred years when people



Fig. 4. Chinese castrate pictured at the end of the last century [15]. Note that castration often meant complete emasculation.

first accepted the challenge of repairing inguinoscrotal herniae (Fig. 5). There were numerous attempts to repair a hernia without castration, but these were on the whole unsuccessful. Surgical practice then became split between the academic surgeons, who based their practice on anatomical knowledge and who tried to develop new surgical techniques, failing which they controlled herniae with trusses, and the gelders, who continued to castrate many children and adults in the course of repairing their rupture. Public opinion moved against the gelders and indeed, Robert de Housse in France served 3 years on a galley for castrating so many boys [16]. The practice of orchidectomy for hernia was finally ended by the late 18<sup>th</sup> century, partly by the efforts of the academic surgeons, with pronouncements like that of Percival Pott (1714–1788); *Anyone who operates for hernia when there was no emergency deserved to be hung as a common felon*.

Opera emerged as an art form in Europe from around 1650 [18]; the voices of castrates were particularly admired for their pure tone and some composers, including Handel and Scarlatti, wrote pieces specifically for the castrati singers. Rossini's opera 'Aureliano in Palmyra' written in 1877 was composed specifically for the voice of the castrate Velutti [5]. It is unclear whether the castrati singers, who also sang in the choirs of the Roman Catholic church despite Christianity's objection to castration, were castrated as a result of hernia repair or were electively castrated so that they maintained their voices. It is likely that some were unfortunate victims of



Fig. 5. Medieval inguinoscrotal hernia repair [17].

bilateral herniorrhaphy, whilst others probably lost their testicles as a result of mercenary relatives, as portrayed in a recent film about one of the most famous castrati singers, Carlo Broschi, also known as Farinelli, which serves as the title of the film.

### Castration for male aggression

Castration has been used over the years as a punishment for prisoners of war, in an attempt to remove any fighting tendencies the prisoners may retain [19]. After the battle of Aduwa in Ethiopia in 1896, it is said that 7000 Italian soldiers were castrated; as a result, when Italy invaded Ethiopia in 1935, the greatest fear of the Italian troops was of being taken captive by the Ethiopians.

In the 11<sup>th</sup> century, the scholar Peter Abelard (1079–1142) was emasculated after he seduced Heloise, the niece of Fulbert, the canon of Notre Dame [4,19], this story forming the subject of many poems and plays.

Castration has also been proposed for many years as a treatment for recidivist sexual offenders. In Denmark, surgical castration was common in the treatment of serious sex offenders until 1972 [20]. The issue as to whether castration is ever indicated in the treatment of such patients was debated in the literature in 1993 [20]. Sexual offenders can remain potent after the procedure, with up to 30% of sexual offenders who were castrated remaining capable of sexual intercourse [21]. Furthermore, there is a small but significant rate of re-offending and 2–3% of patients commit suicide after surgical castration [20]. Indeed, the main determinant of whether a further sexual offence is committed after the procedure appears to be the subject's belief that the procedure will help him [20]. Cyproterone acetate (CPA) has also been used to treat sexual offenders, with some evidence that the long-term outcome is better than that for surgical castration [20]. The debate continues to evolve, with 'headline' stories such as that from Texas, where the courts have sanctioned castration for a serial sex offender [22].

### Therapeutic castration

At the turn of the 20<sup>th</sup> century, surgeons began to consider the therapeutic applications for castration, as more understanding was obtained about the role of the testicles in controlling prostatic development and growth. J. William White wrote a series of articles proposing castration in the treatment of BPH [23,24]. In a series of 200 patients, he reported that the size of the prostate decreased in 87% after castration for BPH and that there was symptomatic improvement in about half the patients [24]. Prostatic size was assessed by a DRE and would

therefore be fairly inaccurate; it is likely that his cohort also included men with prostate cancer, possibly accounting for some of his success. In 1896, Cabot presented a series of 61 patients, 27 of whom were cured of their urinary retention by bilateral orchidectomy, and overall symptoms improved in 87% [34]. This indication for bilateral orchidectomy did not become widely used, as other reports failed to confirm these initial findings [25]. The role for castration in controlling prostate cancer was first described by Charles Huggins (1902–1997) and colleagues in 1941. In two seminal papers, they showed that castration or the administration of oestrogens to men with prostate cancer resulted in an improved clinical picture [26] and a reduction in serum phosphatases [27].

Since then, chemical methods of altering the hormonal milieu in these patients, by interrupting the hypothalamic-pituitary-testicular axis, have been developed [28,29]. Schally *et al.* isolated LHRH analogues in 1971 [30] and showed that they could suppress the release of LH from the pituitary, work for which Schally received the Nobel prize. The clinical benefit of treating prostate cancer with LHRH analogues was reported from 1982 [31–34]. Non-steroidal anti-androgens such as flutamide were first used in the mid 1970s [35], and steroidal anti-androgens such as CPA were approved for use in the 1980s [36]. Other drugs have also been tried; in 1983, ketoconazole in high dose was identified as able to produce castrate levels of androgens within 4–8 h of the first dose [37] and was proposed as an alternative treatment where urgent androgen ablation was required [38]. The side-effect profile at such a high dose, including gastrointestinal disturbance and suppression of cortisol production which resulted in subsequent Addisonian crisis and sudden death [39], has prevented ketoconazole from being licensed for the treatment of prostate cancer.

## Conclusion

Castration has been a part of religious and surgical practice for over 2000 years, as shown by the history of castration from the early Biblical injunctions placed on eunuchs, through the barbarism of ancient Rome and China, to current urological practice. Castration in mediaeval Europe, resulting from early attempts at hernia repair and also practised to provide popular entertainment from the castrati singers, was controversial. Although castration clearly has a role in the treatment of prostate cancer, the controversy surrounding the role of castration in society remains, as shown by continuing debate about the role of castration for the treatment of recidivist sexual offenders.

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