HISTORICAL ARTICLE

Further Observations on the Removal of an Enormous Facial Tumour by Robert Liston in 1834

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ABSTRACT

In 1834, shortly before Robert Liston (1794-1847) left Edinburgh to take up the post of senior surgeon to the North London (now University College) Hospital, he operated on Mrs Fraser, from Banchory, in north-east Scotland. Her tumour was believed to have originated as a result of trauma to the left maxillary antrum. It was immense in size when he first saw it, and produced an enormous degree of facial distortion. The tumour was associated with drooping and disfigurement of the left angle of her mouth and extended forwards from her left external ear to the left side of her nose. Its upper part eventually obstructed the vision of her left eye, while its lower part extended for some inches below the level of her mandible. The volume of the tumour was just slightly less than that of her face. Liston provided a detailed description of her appearance when he first saw her, and gave a detailed history that suggested its possible aetiology. Descriptions of her pre-operative cast were previously published in this Journal in 2000. Since then, additional casts showing her post-operative appearance and that of her tumour have been located, and these form the basis for this follow-up account.

Background

In 1828, when she was approximately 34 years old, a Mrs Fraser of Banchory in Aberdeenshire, received a blow in the region of her left maxillary antrum from a child she had been holding. A hard swelling soon developed in this region and over the period of the next four years it gradually increased in size. She became pregnant at the beginning of the second half of this four year period, round about 1831. During the second half of this pregnancy, she noted that the increase in volume of the tumour was particularly noticeable. It also became more vascular following each of her menstrual periods after the delivery of the child of this pregnancy. She became pregnant again, about a year later, and the mass continued to increase in size, but was not at any time painful. After the delivery of the child of this latter pregnancy, she became menopausal. When, at intervals, she suffered from ill health, the area close to her gums bled to a limited extent.

In 1834, she was referred to the eminent Edinburgh surgeon, Robert Liston (1794-1847), who removed the tumour. The pre-operative history associated with this case was described in some detail by the author and M T Royds in 2000.[1] Liston published two engravings that clearly display the appearance of Mrs Fraser's face with her enormous tumour. One was a right fronto-lateral view (Figure 1),[2] while the other was a left fronto-lateral view (Figure 2).[3] Liston indicated that: "From the part of the tumour next to the ear to that part in front of the face it measures about nine inches." It was formerly believed that trauma could cause a cancerous growth. In cases of tumours of the breast and testis, for example, it appears that blows to these regions might, in fact, draw attention to their presence.

Figure 1 Engraving showing right fronto-lateral view of the pre-operative appearance of the face of Mrs Fraser, showing the considerable degree of disfigurement of her nose and left side of her mouth produced by her enormous tumour. Image from reference 2.

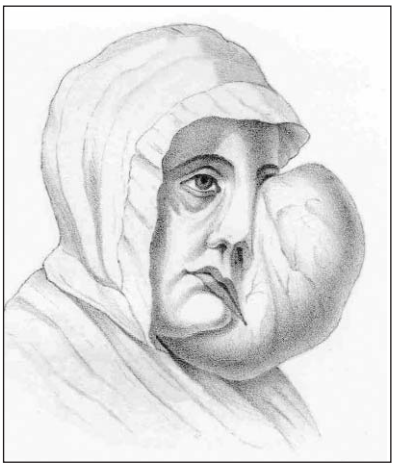

Figure 2 Engraving showing left fronto-lateral view of the pre-operative appearance of the face of Mrs Fraser. This shows her right hand holding a handkerchief to collect the almost continuous flow of saliva that escaped from the left side of her mouth. Image from reference 3.

Operative removal of the tumour

Liston published this case, in a review article entitled: "Observations on some tumours of the mouth and jaws."[4] He had operated on four similar cases, and noted that while the overall prognosis for tumours of this type was generally poor, particularly when the upper jaw was involved. Very occasionally the outcome was surprisingly good.[5] Of the cases he described, eleven had died either very shortly after surgery, or due to a recurrence of the condition. One of the few exceptions was Mrs Fraser, where the outcome was so favourable that it is likely that it even surprised Liston. The finding of a contemporary coloured pre-operative plaster of Paris cast of her head, associated with a post-operative cast that was prepared some time after her face had completely healed justified a follow-up account of this case. Liston indicated that "The left maxilla with the tumour was excised and she made a good recovery."

Liston further indicated that:
"During the cure, and until the edges of the opening in the palate have cicatrized, and until the aperture has constricted as far as it is inclined to do, the patient is rendered more comfortable by wearing a little paste made of crumb of bread well kneaded; this prevents foreign matter lodging in the wound, improves speech, and forms no bad dressing, a poultice in fact to the part. It is wonderful how much, after these operations, the parts come together."[6]

Pre and post-operative casts of the head of Mrs Fraser, and cast of her tumour

A number of examples of the pre-operative cast of her head associated with her tumour were known to exist. These were located in the Ballingall Collection, formerly the Museum Collection of the Class of Military Surgery of the University of Edinburgh.[7] It is believed that the plaster of Paris cast was the original copy made.

The Ballingall Collection also contained a copy in coloured wax made from the same negative mould, and formerly believed to have been the only other example of this cast known to exist. Very recently, an additional contemporaneously coloured (Figures 3a and 3b) plaster of Paris pre-operative cast was located in the Museum Store of the Royal College of Surgeons of Edinburgh, although the dilated blood vessels that were originally featured on the wax cast are not seen.

Figure 3a Contemporaneously coloured plaster of Paris cast of the pre-operative appearance of the face of Mrs Fraser, being a similar view to that shown in Figure 1. Courtesy of Royal College of Surgeons, Edinburgh.

Figure 3b Contemporaneously coloured plaster of Paris cast of the pre-operative appearance of the face of Mrs Fraser, being a similar view to that shown in Figure 2. Courtesy of Royal College of Surgeons of Edinburgh.

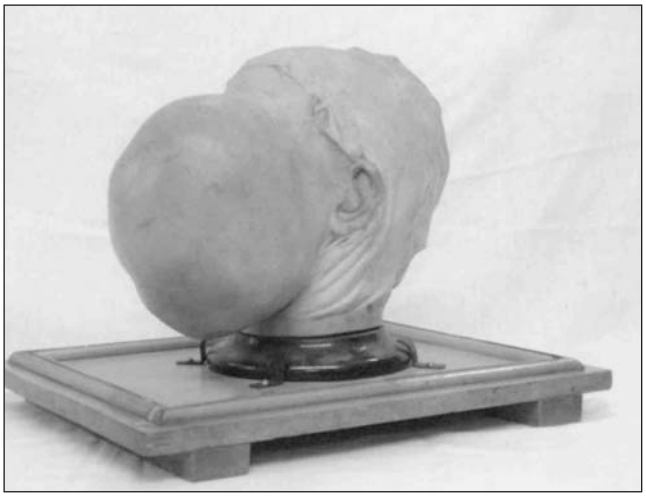

Figure 4 Left fronto-lateral view of the post-operative plaster of Paris cast of the face of Mrs Fraser, showing the relatively small wound in her maxillary region where the tumour had been removed. It is believed that this cast was prepared some considerable time after her face had completely healed. This cast is associated with a wax cast of the tumour. Courtesy of Royal College of Surgeons of Edinburgh

Two other wax casts have also been located. One consists of the head of Mrs Fraser showing the appearance of her face *after* the successful removal of her tumour, while the second is that of the tumour Liston had removed. Both preparations were mounted within the same demonstration cabinet (Figure 4). The casts in the Ballingall Collection are believed to be "Life Masks" rather than sculptured models prepared to display her appearance.[8] The wax cast in the Ballingall Collection, however, had the advantage over the uncoloured plaster of Paris cast in that an effort had been made to accurately display the dilated blood vessels that coursed just beneath the skin overlying the tumour.

The description of the plaster of Paris cast in the Ballingall Catalogue[9] reads as follows:

B. 36. Cast of a head very much distorted towards the left side by an enormous tumour of the antrum, which was removed by Mr. Liston. – See a paper on tumours in the "Medico-Chirurgical Transactions" vol. xx. Page 186. Presented by Robert Liston, Esq.

The description of the wax cast of the tumour that was formerly located in the Anatomical Museum of the University of Edinburgh and published in the Catalogue of the Specimens in the Anatomical Museum[10] reads as follows:

Os.G.1.12 (596). A cast in wax of an enormous fibro-sarcomatous tumour,[11] springing from the antrum of Highmore [the maxillary antrum] which was removed by Mr Liston in the Royal Infirmary.

This preparation has not been located in the Anatomical Museum, and it must be assumed that it has been lost at some stage after it was included in this Catalogue.

Liston published a summary of the operation undertaken by him in the following terms:

"the soft parts were divided by an incision which traversed the mesial surface of the tumour: and terminated in the angle of the mouth. The alveolar process (the two central incisors having been previously extracted), the palatine plate, and the nasal process of the maxilla were then cut with the forceps. An incision was carried along the upper surface of the tumour under the inferior eyelid to over the junction of the malar and frontal bones, and prolonged from that, in the line of the zygoma, to near the auricle. The bones were then cut, into the spheno-maxillary fissure and into the zygomatic arch, - all this was done with but little interference with the vascular supply. The connection being loosened, and the tumour shaken to its base, the soft parts underneath were divided, and the mass was turned out without difficulty. … the bleeding vessels were secured. Nothing interrupted her recovery, and the deformity is much slighter than would be imagined."[12]

The College's post-operative cast was clearly partly prepared from the original negative mould, as the creases in Mrs Fraser's cap appear to be identical to those seen on the pre-operative cast. The rest of the mould probably represents a skilful copy of her appearance made by an individual with obvious sculptural experience. The legend in the College's Museum Catalogue, indicates that the tumour was believed to have been a "fibroma of the left maxillary air sinus." Its extirpation required the removal of the left half of her palate and produced a substantial deficiency in the wall of her left cheek that exposed a considerable amount of her oral cavity and tongue. This necessitated the wearing of an artificial denture or palate, made of gold prepared about a year later by Mr Nasmyth. Liston noted that the artificial palate contained:

"a portion attached to fill up the space (not very large) in the cheek. Besides removing the deformity, the patient is thus enabled to swallow comfortably and articulate distinctly."

Dimensions and features of the fibrous tumour

The College of Surgeons of Edinburgh's Museum Catalogue revealed that:

"The original tumour is in the Museum of the Royal College of Surgeons of England and is thus described; - The tumour is of irregular form, superficially lobed, and smoothly rounded in every part. Its diameters are – vertically and transversely 175 mm. and anteroposteriorly almost 150 mm.; the portion of integument removed with it measures about 300 mm. in length and 250 mm. in breadth. Towards the mouth the tumour presents a circular concave surface, projecting on every side beyond the palate. A section from the left side of the tumour showed it to be composed of a pale, whitish, firm, compact, and homogeneous fibrous tissue."

From the description of the operation to remove the tumour, and the fact that there appeared to be no obvious evidence of spread, for example to the cervical lymph

nodes, the impression is formed that the patient was indeed extremely fortunate. The original stimulus to the growth of this tumour was believed to be the traumatic blow to her left malar or cheek region. This induced a local periosteal reaction followed by progressive hypertrophy of the overlying tissues. The fact that the tumour responded to hormonal stimuli, was an unusual feature. Liston's hypothesis, that the tumour was either benign, or of only a very low-grade malignancy was confirmed by the patient's complete post-operative recovery. On her return to Banchory, her local surgeon, Mr Francis Adams,[13] reported that:

"Having seen the mother of the lady with the gold palate yesterday, I am enabled to assure you that she continues perfectly well. She finds Nasmyth's apparatus answer [sic] admirably, and has completely recovered her voice, which you may remember was somewhat indistinct for some time after the operation. In a word, she is one of the most happy women I am acquainted with."

As Liston presented the original specimen of the tumour to the Museum of the Royal College of Surgeons of England, it is likely that they also possessed copies of the pre- and post-operative casts described here. They were therefore contacted to establish whether these items had indeed been donated to them shortly after Liston arrived in London, and had been listed in their Museum Catalogue. Of the 51 items presented to them by Liston, these items, the potted specimen of the tumour, and the pre- and post-operative casts of the head of Mrs Fraser, were unfortunately not listed on the Museum's current database. It is believed that they were probably lost during the bombing raid in the Second World War that destroyed much of the College's historic pathological collection.

Acknowldegements

I am grateful to Mr Andrew Connell for drawing my attention to the various Casts casts relating to Mrs Fraser located in the Museum Store of the Royal College of Surgeons of Edinburgh.

REFERENCES

1. Kaufman MH, Royds MT. Excision of a remarkable tumour of the upper jaw in 1834 by Robert Liston. Scot Med J 2000; 45: 57–59

2.Liston, R. Observations on some tumours of the mouth and jaws. Medico–Chirurgical Transactions 1837; 20: 165–99. When this manuscript was submitted, Liston styled himself "Surgeon to the North London Hospital, etc., etc." see: Plate 2, Figure 1. Note that this plate is located at the end of this volume, following the text of the various articles. Hutchinson & Swandale prepared the drawing of Mrs Fraser shown here, while J. Perry prepared the engraving. It is assumed that these individuals were based in Edinburgh

3. Liston, R. Practical Surgery. With One Hundred and Twenty Engravings on Wood. John Churchill; Henry Renshaw, London, 1837. See: Chapter entitled: On Morbid Growths and Enlargements, associated with an engraving of a left fronto–lateral view of the head and face of Mrs Fraser displayed on page 263

4. Liston, see ref. 2

5. All of these operations were performed before the availability of anaesthesia. Liston performed the first operation under ether general anaesthesia in England, at University College Hospital, in 1846, and James Young Simpson first investigated the anaesthetic properties of chloroform in Edinburgh in 1847

6. It has previously been noted that the mouldy bread might have had a mild bactericidal action on the wound site. Ibid, on the wound site. See ref.1 p.59

7.All of the specimens in the Ballingall Collection were recently transferred to the Museum Collection of the Royal College of Surgeons of Edinburgh on long–term loan. long term loan. See also: Kaufman, MH. The Regius Chair of Military Surgery in the University of Edinburgh, 1806–55. Amsterdam, New York; Rodopi, 2003

8. Much experience was available at that time in the preparation of both life masks and death masks, particularly by those who professed an interest in the "science" of phrenology. See, for example: Kaufman, MH. (editor). Death Masks and Life Masks of the Famous and Infamous. Edinburgh; Scotland's Cultural Heritage Unit, 1988 (Illustrated Exhibition Catalogue, 42 pp.). See also: Kaufman, MH. Edinburgh Phrenological Society: A History. Edinburgh; William Ramsay Henderson Trust, 2005. Plaster of Paris 'negative' moulds were first prepared, and 'positive' moulds made from these. These were usually painted white, or given a 'bronze' or similar appearance. Rarely, they were coloured to resemble the appearance of the individual, as with some of the examples described here. Occasionally, as in the case of the cast of the tumour, the 'positive' mould was made of wax. It is likely that all of these casts were originally used for teaching purposes

9. Ballingall, G. Catalogue of the Museum attached to the Class of Military Surgery of the University of Edinburgh. R & R Clark, Edinburgh, 1855: see p. 31

10. Anon. Catalogue of the Specimens in the Anatomical Museum of the University of Edinburgh. Vol. 1. – Pathology. James Thin, Edinburgh, 1909. Section entitled: Tumours of the Bones of the Skull. Sarcoma. See p. 103

11. The nature of this tumour was probably determined on the basis of its gross morphology. It had a "homogeneous fibrous" structure [see note in Edinburgh College's Museum Catalogue]

12. Liston, see ref. 2, p. 188

13. He was a well–known translator of Greek medical works (information supplied by Mr David Hamilton)