

ELECTIVE (SSC5a) REPORT (1200 words)

A report that addresses the above four objectives should be written below. Your Elective supervisor will assess this.

Medical Elective - Oral and Maxillofacial surgery at Amsterdam UMC

Introduction

For my final year medical elective, I had the privilege of joining the esteemed Oral and Maxillofacial surgery (OMFS) department of Amsterdam University Medical Centres (UMC) in The Netherlands. In discussing my desire to gain a wider appreciation of maxillofacial trauma management with senior colleagues, I was universally recommended to seek my final year elective with Prof Leander Dubois for his pioneering and ground-breaking approach to craniofacial trauma management. Fortunately, Prof Dubois and the Amsterdam UMC OMFS team was kind enough to graciously accept and welcome me into their department and I was able to witness their forward-thinking approach to craniofacial trauma management. This report aims to provide an insightful account of my experience with Prof Dubois and the OMFS team at Amsterdam UMC while also exploring how OMFS and trauma services are structured in the Netherlands and how this compares to the UK.

Clinical Experience

The Dutch healthcare system operates under a universal social health insurance system. This model is financed through taxes and statutory health insurance from the private sector. Access, quality, and prices are monitored by the government with targets implemented for healthcare providers while competition is promoted between insurance providers to promote efficiency. This approach to healthcare has been rather successful with most Dutch citizen experiencing excellent accessibility and positive healthcare outcomes as compared to EU averages (1). Comparing healthcare systems between nations is far from straightforward but there are some obvious differences in the management of OMFS trauma between the UK and The Netherlands.

- 1). Research and data driven care
- 2). Trauma management philosophy
- 3). Use of advanced technology to assist in surgical reconstruction

The OMFS team in Amsterdam truly believe in the merit and value of research. I was shocked to discover that a majority of the OMFS residents have completed or are currently completing a PhD. This commitment to broadening our understanding of the specialty is key to improving OMFS in the widest possible sense and it was enlightening to see that this level of academic excellence was encouraged and supported. From my limited experience in carrying out audit and research, a robust data set is paramount to developing reputable and worthwhile findings. Their department is modelled to review specific trauma injury patterns at set milestones recording quantitative variables for key outcomes such as the use of Hertel exophthalmometer to measure any enophthalmos following orbital trauma. This structured and systematic approach to care removes any personal biases and allows the clinician to focus on providing the right treatment to the right patient at the right time.

The commitment to research and data has allowed the department to produce some fascinating literature on the management of maxillofacial trauma which supports the notion of secondary reconstruction (2, 3). This was perhaps most noticeable in management of orbital trauma. Orbital trauma is a complex and fascinating aspect of OMFS trauma due to intricate anatomy of the orbit and oculomotor system which can produce devastating functional and cosmetic complications when damaged. Their philosophy and research support an extending period of monitoring to allow for the intrinsic regenerative potential of the orbit to correct any initial post-traumatic functional or positional discrepancies. This approach to care removes any potentially unnecessary surgical morbidity, reduces wasted healthcare resources, and allows sufficient time for considered planning of indicated orbits (4).

Finally, and perhaps the most impressive aspect of trauma management I was able to experience was the integration of advanced technology to guide complex craniofacial reconstruction improving predictability and surgical outcomes. The OMFS department in Amsterdam UMC has a clearly defined workflow and protocol for the management of advanced trauma to achieve optimal results (5).

- Clinical assessment: Firstly, complex orbital trauma is clinically examined on a designated clinic with a craniofacial traumatology professor and the OMFS trauma team where initial measurements, orthoptic/ophthalmological assessment, imaging, and photography is recorded.
- Digital diagnosis: The OMFS department at Amsterdam UMC is fortunate to have an expert team of medical technicians in-house to assist advanced diagnostics. CT scans can be imported into software packages for advanced three-dimensional assessment. Virtual mirroring is utilised to assess any unilateral difference in hard or soft tissue dimensions and plan the reconstruction through re-establishing the pre-traumatised anatomy (6).
- Digital planning and personalised medicine: Once the technician and surgeon have quantified the defect requiring surgical correction, it is possible to fabricate patient-specific implants (PSI) to recreate the complex anatomy of that individuals orbit or personalised osteotomy guides for precise manipulation of the facial skeleton into their pre-traumatised position. Once design has been completed, specific landmarks can be engineered into the PSI.
- Computer assisted surgery and intra-operative CT imaging: Once surgical access has been obtained it is possible to cross-reference specific three-dimensional landmarks to synchronise the positioning of the facial skeleton against the virtual model used for surgical planning. The intra-operative navigational software can then provide accurate positional information to the surgical team to ensure implants, osteotomies and reconstruction is carried out with a degree of precision that is not possible by conventional surgical standards (7, 8). Finally, accuracy is confirmed using intra-operative CT to ensure surgery has been carried out as predicted.

An aspect of public health related to OMFS that has always been fascinating to me is interpersonal violence (IPV) and its relationship to craniofacial trauma. From my time working within OMFS, this is a major cause injury and morbidity for our patients within the UK. However, this was not my experience of OMFS trauma within The Netherlands where the majority of trauma appears to be related to non-violent accidents. This difference is back up by the EURMAT project which analysed maxillofacial injuries across Europe demonstrating only 17.5% of OMFS trauma in Amsterdam is caused by IPV as compared to 53.8% in London (9). Understanding the differences between culturally and societally distinct regions is challenging. Maxillofacial trauma often involves

singular random assaults but are related to a complex network of issues including drug and alcohol usage, crime prevalence, social and economic factors etc. It is difficult to quantify any one particular issue which is responsible for this stark difference but clearly for a city with a hedonistic reputation, what they are doing is working and we could learn from this in the UK.

Conclusion

This elective has been a truly transformative experience where I have been able to gain exposure to cutting edge techniques and technologies which will accelerate improvements in care and allow for superior surgical outcomes. It was truly wonderful to be able to learn from a different system of healthcare and discuss new surgical philosophies on trauma management. The phenomenal clinicians at Amsterdam UMC made me feel incredibly welcome my entire trip and even had their morning meetings in English to facilitate my learning which was incredibly kind. Prof Dubois and his team have inspired and galvanised my passion for research and opened my eyes to new surgical possibilities. I am excited to try and incorporate what I have learned into my practice within the UK and hopefully keep up research links to continue expanding their incredible work.

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