ELECTIVE (SSC5a) REPORT (1200 words)

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

I carried out an elective in craniofacial surgery at Great Ormand Street Hospital (GOSH) based in London, UK. The craniofacial unit at GOSH is one of the four supra-regional funded centres in England, serving the paediatric population in the country as well as international and private patients. The unit is run by a large multidisciplinary team including neurosurgeons, plastic surgeons, ophthalmologists, geneticists, nurse specialists and numerous other professionals, and has state-of-the-art facilities. At GOSH, the craniofacial team treat over 250 new patients a year, making it a leading institution in helping patients with craniofacial anomalies. This elective appealed to me as an ideal learning environment with many opportunities to see world-class healthcare being delivered and to learn about craniofacial disorders from experts within the field.

Craniofacial anomalies (CFA) are a heterogenous group of disorders associated with deformities in the development of head and facial bones. These anomalies are typically present at birth and often associated with other anomalies in the body. CFA can be broadly divided into cleft malformations (cleft lip and/or cleft palate), disorders arising from premature fusion of suture lines (craniosynostosis) and branchial arch syndromes (e.g. hemifacial microsomia, Goldenhar syndrome and Treacher-Collins syndrome) (1). CFA is reported to account for a third of all congenital defects, with a global incidence of 0.2 to 0.5 per 1000 births (2). Cleft lip and palate are the most common type of CFA (1 in 1000 live births). The incidence of craniosynostosis is comparably lower, with isolated craniosynostosis (1 in 2000 live births) being more prevalent than syndromic (1 in 20,000 to 50,000) (2). Approximately, 20% of CFA cases are associated with an underlying genetic disorder. However, this is thought to be an underestimate as new syndromes are being identified every year and it is thought that isolated anomalies often have an unidentified genetic aetiology. There is a paucity of data in the literature with regards to UK-specific incidence of CFA with most papers on epidemiology of CFA citing global incidence rather than local incidence.

In my time at GOSH, I was able to see numerous patients with CFA and conducted research specifically on the topic of sagittal craniosynostosis (SC). SC is the most common form of non-syndromic craniosynostosis, so cases of SC are seen almost every week at GOSH. In all the cases of SC that I saw, patients had clinically notable features such as an elongated anterior-posterior axis, shortened bi-parietal distance, frontal bossing and occipital coning. Whilst no specific tests are necessary for diagnosis of SC, I learnt that patients often have some form of imaging carried out, usually at the external institution from which they were being referred from. This was most commonly in the form of skull radiographs or CT head. Imaging can be used to confirm diagnosis and for operative planning purposes. Patients may also undergo genetic testing to identify specific genes that could be associated with causing SC. Whilst at GOSH, I also learnt about and observed the different operative interventions that are available to children with SC at this institution, which ranged from cranial vault remodelling to more minimally invasive techniques like spring-assisted cranioplasty. Like with almost any intervention, there are always multiple factors that need to be considered before proceeding with treatment. For patients with SC who present to GOSH, the patient's age helps to guide the decision on which procedure they should have. For patients older than 6 months of age, they are most commonly offered some form of vault remodelling. Younger patients, who typically have greater bone regeneration potential and skull pliability, are more commonly offered spring-assisted cranioplasty (SAC) - which I found out is not routinely offered at other institutions. I was able to observe both types of procedures being carried out and I noticed how significantly different the techniques were. All the craniofacial surgeons at GOSH seemed to be big advocates for SAC and I could appreciate the reasons why this was the case; SAC was a much shorter operation, with minimal blood loss and a shorter hospital stay compared to vault remodelling. I was also interested to learn how the SAC technique had evolved over the years following a few complications in the early years of this technique being introduced. Surgery is a constantly evolving field. As we gain a better understanding of disease and the intricate mechanisms and processes of the human body through academic research and collaboration, we can develop our techniques and use new tools and technology to improve outcomes for patients.

Whilst I have not carried out a placement abroad in the developing world before, I appreciate that there will be numerous similarities and differences in terms of craniofacial care and services available when compared to GOSH. The epidemiology of craniosynostosis is poorly characterised at a global level, particularly in the developing world. However, one study carried out in the Asian continent found that the mean age of diagnosis and operation, when compared to Western countries, was higher - this difference may be attributed to cultural discrepancies and misinformation (3). In terms of traits of craniosynostosis, the distribution between Western countries and developing countries like Vietnam are similar - with SC being the most prevalent variant (4). At GOSH, SAC is the procedure of choice for children under the age of six months. In Vietnam, however, vault remodelling is the mainstay treatment option and there is no documentation on the use of SAC techniques. Another difference between craniofacial surgery in the developing world and in the UK is that low-income countries lack resources and facilities that world-class institutions like GOSH have - for example, advanced CT imaging facilities may not be available in certain parts of the world, thus pre-operative planning is limited in the poorer parts of the world. GOSH is relatively well-funded and can easily attracts leading experts in the field so rapid advancements in surgery and good and safe patient outcomes are expected. The challenges in the developing world are different where resources and expertise may be lacking and demand for such services possibly even greater.

My elective at GOSH was a unique experience where I got to see highly specialised care being provided at a world-leading institution. I had the opportunity to interact and learn from experts in the craniofacial field, see patients with rare conditions and observe surgical procedures that I would not see happening elsewhere. Additionally, I had the opportunity to get involved in conducting research alongside another colleague. Together, we investigated the long-term outcomes for a cohort of patients who had SC and found that regardless of timing and type of intervention children had, majority of patients fared well in terms of aesthetic and neurocognitive outcomes - findings that I think will reassure craniofacial surgeons, parents, and patients with SC around the world. Carrying out research always takes commitment and dedication, but I think it was certainly worthwhile in this case and important for us conduct this for the wider scientific community and patients. On a personal level, I found both the research and clinical component of my elective to be rewarding and fascinating. I have learnt a lot about an area of medicine that is not covered in the medical school curriculum, I was able to dive deep into surgical techniques and observe healthcare being delivered at a leading institution for paediatric surgery.

1. Tarawneh A, Alrbata R, Fazemi K, Hadaddin K. Orthodontic Management of Craniofacial Anomalies, A Summary of the Available Options. International Journal of Dentistry and Oral Health. 2016;2.
2. Demke JC, Tatum SA. Craniofacial Surgery for Congenital and Acquired Deformities. In: Lesperance MM, editor. Cummings Pediatric Otolaryngology (Second Edition). Philadelphia: Elsevier; 2021. p. 77-104.
3. Byun IH, Hong JW, Hussein MA, Kim YO. Demographic characteristics of craniosynostosis patients in Asia. Journal of Cranio-Maxillofacial Surgery. 2018;46(4):674-8.
4. Can DDT, Lepard JR, Anh NM, Tuan PA, Tuan TD, Son VT, et al. Nonsyndromic craniosynostosis in Vietnam: initial surgical outcomes of subspecialty mentorship. Journal of Neurosurgery: Pediatrics. 2021:1-8.