British dental surgery and the First World War: the treatment of facial and jaw injuries from the battlefield to the home front

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IN BRIEF

- Enables a greater understanding of the development of the Army's dental provision during the First World War.
- Highlights the role of dental surgeons in the treatment of patients with facial and jaw injuries.
- Develops a broader knowledge of key dental surgeons from the era.

GENERAL

When Britain went to war in 1914, the British Expeditionary Force was deployed without a single dentist. Initially considered combatants, the only dental professionals who could serve at the Front were medically qualified dental surgeons in the Royal Army Medical Corps. In treating the traumatic facial and jaw injuries caused by trench warfare, the dental surgeons of this era earned their place on specialist surgical teams and established the principles of oral and maxillofacial surgery. This article will examine the contribution of specialist dental surgeons to the management of facial and jaw wounds in the First World War along the chain of evacuation from the battlefield to the home front, using illustrative examples from the Hunterian Museum at the Royal College of Surgeons of England.

INTRODUCTION

On 29 August 1916, the field dressing station of the 7th Division Royal Welch Fusiliers had just been established outside the Delville Wood (the Devil's Wood) in Northern France as a part of the Somme Offensive. The unit's medical officer, William Kelsey Fry (1889–1963), would have been going about his duties, tending to severely wounded patients and preparing to receive more casualties. Well-liked by his battalion for his friendly manner and bravery under fire, Kelsey Fry had already been injured in the line of duty. He received the Military Cross for his actions at Festubert, where he was shot in the back of both legs while retrieving an injured soldier from the battlefield.[1] At 4 pm, a shell hit the division's medical post, instantly killing patients and doctors alike. Under heavy fire, the battalion searched for survivors. Only Kelsey Fry was dragged from the rubble alive.

One of the few ways for a dental surgeon like Kelsey Fry to be posted to the Front at the beginning of the First World War was serving in the dangerous role of Regimental Medical Officer in the Royal Army Medical Corps (RAMC). In his time at the Front, Kelsey Fry was presented with traumatic facial and jaw injuries unlike any dental surgeon had experienced in civilian practice. Over the course of the war, the value of dental knowledge was increasingly recognised and dental professionals played a crucial role in the health of the fighting force. The benefits of involving dental surgeons as full members of the teams treating these injuries established a fundamental principle in the evolution of oral and maxillofacial surgery over the next 100 years. This article will examine the contribution of specialist dental surgeons to the management of severe facial and jaw injuries in the First World War along the chain of evacuation from the battlefield to the home front. Set against the background of the development of general dentistry during the war, objects from the collections at the Hunterian Museum of the Royal College of Surgeons of England will serve to illustrate the foundation of oral surgery as a speciality.

DENTISTRY GOES TO WAR

Since the seventeenth century, it was believed that general army surgeons could adequately tend the dental needs of soldiers. With the invention of automatic rifles, the retention of teeth was a low priority, as they were no longer required to load a gun.[2] The passing of the Dentists Act in 1878 brought about an important time of change in the dental profession with the founding of the Dentists Register. From that point, the term dentist officially referred to a registered practitioner with a Licentiate in Dental Surgery (LDS) or a Bachelor of Dental Surgery (BDS). Despite this professionalisation, when the Second Boer War began in 1899, no dentists were sent with the Army to South Africa. However, oral problems were a leading cause of troops becoming unfit for duty, with over one-third of admissions to the hospital for dental caries being discharged from the Army.[2] In 1900, dentist Frederick Newland Pedley was permitted to treat the troops in South Africa, provided he brought his own equipment and incurred no expense to the government.[3] When Britain went to war in 1914, the Army's dental provision was no better than it had been at the turn of the century.

As the Great War began, dentists were initially enlisted as combatants. Upon mobilisation, the British Expeditionary Force (BEF) was sent to France without a single dentist. It wasn't until General Douglas Haig, commander of the BEF, had a toothache in the autumn of 1914 that the Army's view of dentistry started to change. Haig was attended by a French-American dental surgeon, Charles August Valadier (1873–1931), who was subsequently appointed the first dental surgeon to treat British troops on the Continent. By the end of the year there were 20 dentists treating the military.[2] In 1916, the Military Services Act was passed and the number of dentists sent to the front lines began to increase. The Act introduced mandatory conscription but dental pathology was a leading cause of rejection for new recruits. Army dental officers were required to render the influx of conscripts fit for duty. Dentists also began to be attached to casualty clearing stations and by August 1916

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Fig. 1 Portrait of Private William Riley by Henry Tonks, 1917. Riley was an assistant medical officer to William Kelsey Fry. The two met again when Riley was admitted to the Cambridge Military Hospital in Aldershot where he was treated by Kelsey Fry. RCSSC/P 569.17. Courtesy of the Hunterian Museum at the Royal College of Surgeons of England

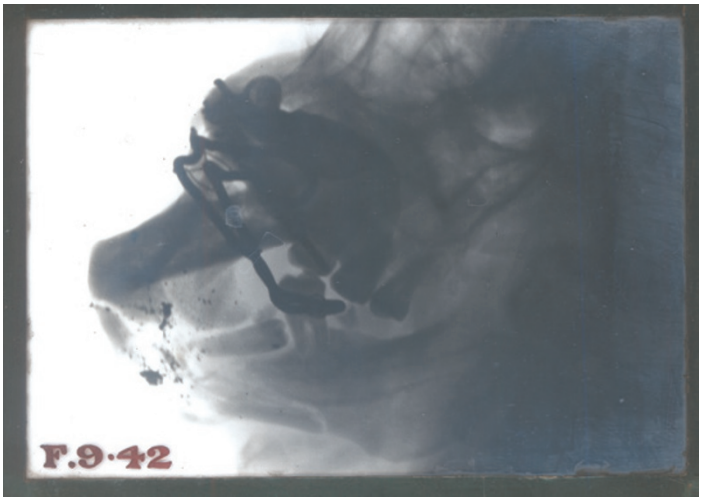

Fig. 2 Radiograph of a fractured jaw caused by a rifle bullet, from a patient at the Croydon War Hospital. RCSOM/F 9.42. Courtesy of the Hunterian Museum at the Royal College of Surgeons of England

the number of dental professionals serving on the Continent had reached 300.[2]

These small strides in improving the dental care of combatants didn't change the fact that Britain was lagging behind many of the Imperial and Allied nations in terms of dental care, both general and specialist. Soldiers at home and at the Front needed not only the support of general dentists but also dental surgeons with specialist knowledge of facial and jaw injuries. The nature of trench warfare exposed the head and neck to traumatic wounds as soldiers peered over the dugout trenches. This context, combined with high velocity rounds and explosive shells, meant soldiers didn't just receive superficial gunshot wounds; parts of the entire jaw and face could be shot away. Despite the severity of these injuries and a high initial mortality rate, for those who received treatment, there were a remarkably high number of survivors. In 1917, Valadier reported that of the 1,010 cases treated by his jaw unit at the 83rd General Hospital in Wimereux, there were only 27 fatalities.[4] As a result of these factors, the medical services needed to deal with large numbers of disfiguring but non-lethal facial injuries. Dental surgeons could bring a specialist understanding of the affected region as well as the technical knowledge and ability, in the form of splints and dentures, to effectively treat these wounds.

DENTAL SURGERY ON THE FRONT LINES

The soldiers with facial injuries that Kelsey Fry sent from the battlefield would have made their way through the chain of evacuation from field dressing station on to a casualty clearing station and eventually to the base hospital. British plastic and maxillofacial surgery emerged from the collaboration between dental and surgical practitioners which began in a British base hospital in France in 1915. In that year, the young otolaryngologist Harold Gillies (1882–1960) was assigned to assist Valadier in his operations at the newly organised unit at Wimereux outside Boulogne. There, Valadier supplied much of the equipment himself and fitted his Rolls Royce with a dental chair and drills.[5] Working alongside him, Gillies was introduced to the challenges of maxillofacial surgery. Wimereux became a centre for facial injuries on the Continent with the unit receiving patients from the battlefield, providing immediate treatment and distributing them down the chain of evacuation. The collaboration between dental and plastic surgeons was a practice which continued throughout the war, first at Wimereux, later at the Cambridge Military Hospital in Aldershot, and eventually at the Queen's Hospital in Sidcup. After the dental surgeon Leonard King left Aldershot to work with Valadier, Kesley Fry was appointed to provide the dental counterpart to the plastic skills of Gillies. As Kesley Fry supposedly said upon their first meeting, '*I'll take the hard tissues. You take the soft.*'[6]

Specialist treatment at the Front by dental surgeons was vital for the survival of soldiers with facial injuries. Kelsey Fry observed that jaw wounds created a great risk of suffocation unless treated with the utmost care. On one occasion, he had rescued a soldier with a severe facial injury from the battlefield and helped him to a clearing station, but the soldier died within minutes of arrival when he was laid down on his back on a stretcher, resulting in an airway obstruction.[1] After Kesley Fry buried his patient, he recalled, '*I made up my mind that if I had an opportunity of teaching that lesson to others, I would do so. That was the milestone of my life.*'[7] There can be little doubt that he played a central role in improving the management of facial and jaw injuries. Recognising that not enough was being done to send these cases to an institution staffed by knowledgeable practitioners like Kesley Fry, Harold Gillies devised his own plan to navigate the convoluted chain of evacuation. He purchased labels at a stationery shop on the Strand and completed them with the details of his new plastic and jaw unit at Aldershot, distributing them to clearing stations with instructions to send facial injury cases to him.[1] It wasn't long until labelled soldiers were sent back to the Cambridge Military Hospital for secondary treatment.

SECONDARY TREATMENT AT HOME

'*When his [Valadier's] patients came to England, some went to Queen Mary's Hospital, Sidcup, others to the Croydon Jaw Hospital, where the cases came under the care of Honorary Consulting dental surgeon Sir Frank Colyer. Colyer removed the splints, extracted doubtful teeth, treated the sepsis and prided himself that his treatment was sound and Valadier's unsound.*'[5] Speaking at the Royal Society of Medicine in 1974, Cyril Bowdler Henry recalled his early work as a dental surgeon in the First World War. While Harold Gillies is the pre-eminent surgeon usually associated with the treatment of facial injuries in this period, he was just one of a larger group of plastic and oral surgeons working across Britain and Europe to treat the traumatic injuries produced at the Front. It was the goal of frontline care to either return soldiers to the field or evacuate casualties to Britain. For many with facial injuries, arriving at home was just the beginning.

J. Frank Colyer (1866–1954) was one of the leading practitioners in the world of oral surgery in his position as Honorary

Consulting dental surgeon of the Croydon Military Hospital. Before Harold Gillies founded his unit in Aldershot in early 1916, Croydon was Britain's only specialist jaw institution. In academic circles, Colyer was a formidable figure, famously disagreeing with Valadier over whether teeth should be retained in jaw fractures. Colyer would go on to play an important role in the establishment of the Queen's Hospital in Sidcup. He was knighted for his services to the nation's troops in 1920, ten years before Harold Gillies.[8] At the Hunterian Museum, the collection of radiographs and dental casts of patients treated at Croydon serves as a reminder of this important work. The radiographic images show the severity and complexity of the jaw fractures Croydon was receiving from the Front. In treating jaw injuries, which were often in a septic condition and broken into a number of pieces, radiographs and dental casts played an important role in the assessment and treatment of the patients at Croydon. Discovered by German physicist William Röntgen in 1895, by the First World War X-ray technology was already widely used for medical purposes. However, the early machines were made for abdominal injuries and not well suited for facial injuries. Colyer had to do without a specialist dental X-ray unit to create these radiographs.[9]

Of course, not all the estimated 60,500 British soldiers who received head and eye injuries in the war could be treated just at Croydon and Sidcup.[10] The case files of the Queen's Hospital, now in the archives of the Royal College of Surgeons, attest to the wide number of hospitals across the UK which received these soldiers. Many of the patients treated by Gillies' team at Sidcup had already undergone bone grafting or plastic operations at other institutions. Hospitals doing notable work in oral surgery included the King George Hospital in London under the care of dental surgeon Charles Henry Chubb and the 3rd London General Hospital in Wandsworth with a dental department led by William Warwick James and William Hern. Stereoscopic images of patients undergoing treatment at Wansdworth are now preserved in the Hunterian Museum.[11] Warwick James believed that this technology allowed him to better view the depth and subtleties of the injuries in order to record the progress of treatment. At the Queen's Hospital in Sidcup, the same purpose was fulfilled with the pastel portraits created by the artist and surgeon Henry Tonks to document Harold Gillies' plastic work.

While the Army was initially reticent to send dental surgeons to the Front, surgeons at home quickly acknowledged the importance of incorporating their dental colleagues into their teams. At a meeting of dentists and surgeons convened by the Royal Society of Medicine's (RSM) Odontological Section in 1916, practitioners came together to discuss how dentist and surgeon could, and must, work together to address facial and jaw injuries. An Honorary Surgeon to the King George Hospital noted at the meeting, '*Surgeons are, and have been, greatly to blame for their failure to appreciate what great assistance- nay more what essential assistance- can be afforded by the early intervention of a skilled dentist.*'[12]

THE DENTAL LEGACY OF THE FIRST WORLD WAR

There can be little doubt that the dental service provided by the British military in the First World War, both general and specialist, was initially inadequate, particularly when compared to European nations. As one observer noted in 1916, 'the French and Italians have realised the importance of the dentist and have provided a dental corps for every field hospital'.[13] When the war began, hospitals across Germany were already prepared for soldiers with facial injuries.[14] The situation in Britain had improved towards the end of the war when commanders could request a general dentist to be attached to their units.[15] However, by the Armistice in November 1918, there were still only 831 dental surgeons serving the Army at home and abroad.[2] The Croydon War Hospital remained the only specialist jaw hospital in England organised by an Army Command, although it was later complemented by the privately funded Queen's Hospital. In 1916, dental surgeon Frank Montagu Hopson lamented his, '*profound regret that the Army Medical Department has not even yet made adequate provisions for ...[dental] treatment, despite warnings which were given and offers of assistance which were made at the very commencement of the war.*'[11]

Despite the initial reticence of the Army to officially incorporate dental colleagues into their ranks, dental surgeons played a central role in the treatment of facial and jaw wounds in the First World War. The prevalence of jaw injuries encouraged the dental and plastic specialities to collaborate on the management of these patients. As a result of the persistence and ingenuity of First World War dental practitioners, an Army Dental Corps was established in January 1921 by the Secretary of State for War, Winston Churchill.[2] The collections at the Royal College of Surgeons of England provide examples of objects through which these stories can again be revealed. From the battlefield to the home front, soldiers with traumatic facial and jaw injuries were supported specialist teams in which dentists played a crucial role. The pioneering work of dental surgeons of this period contributed to the foundation of the speciality which was later to become oral and maxillofacial surgery. As William Kesley Fry observed in 1917, '*Neither the dental aspect is neglected by Major Gillies, nor the surgical aspect by myself, and the reconnaissance into the other man's territory has led to the closest cooperation between us working as a team and we believe with satisfactory results.*'[7]

Fig. 3 Oral splint with an expansion bar from the First World War. RCSOM/K 20.912. Courtesy of the Hunterian Museum at the Royal College of Surgeons of England

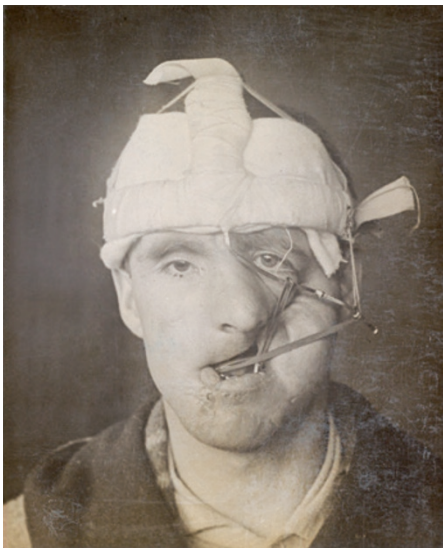

Fig. 4 Stereoscopic image of one of William Warwick James's patients at the 3rd London General Hospital in Wandsworth, 1914–1919. RCSHM/Z 81.1. Courtesy of the Hunterian Museum at the Royal College of Surgeons of England

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More information about the fascinating relationship between the First World War and advances in oral and maxillofacial surgery can be found at the Hunterian Museum in London. Indeed, to mark the centenary of the outbreak of the Great War, the Museum is staging an exhibition entitled *War, Art and Surgery* from 14 October 2014 – 14 February 2015. Entry is free and more information can be found at: http://www.rcseng.ac.uk/museums/hunterian/war-art-and-surgery/exhibitions-and-displays