

From “Horrid Butchery” to “Supreme Triumph”: The Birth of Modern Thyroid and Parathyroid Surgery

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Introduction

- Thyroidectomy and parathyroidectomy are now routine, frequently outpatient procedures
- Easy to forget that they were once considered extremely challenging and even potentially deadly operations
- The advancements that led to safe thyroid and parathyroid surgery were among the most significant in the history of modern surgery

The history of goiter

- Goiter among the earliest described medical conditions
- Numerous medical and attempted surgical therapies throughout the history of medicine:
 - Seaweed
 - Sponges
 - Cauterization
 - Setons
 - Drainage
 - Shoestring ligation

Early attempts at thyroidectomy

- Before mid-19th Century, thyroid resection attempted by several European surgeons with typically disastrous results
 - Hemorrhage
 - Infection/Sepsis
- Overall mortality rate >40%
- Banned by French Academy of Medicine in 1850

Samuel Gross, 1866



Thomas Eakins, 'The Gross Clinic', 1875

- “No sensible man will... attempt to extirpate a goitrous thyroid gland. Every step he takes will be envisioned with difficulty, every stroke of his knife will be followed by a torrent of blood and lucky will it be for him if his victim lives long enough to enable him to finish his horrid butchery.”

Pitfalls of thyroidectomy



Theodor Billroth (1829-1894)

- Billroth: legendary surgeon (first esophagectomy, gastrectomy, laryngectomy)
- Not so fortunate with thyroid surgery...
 - 25% recurrent laryngeal nerve injury
 - 10.5% tracheotomy
 - Initial 40% mortality

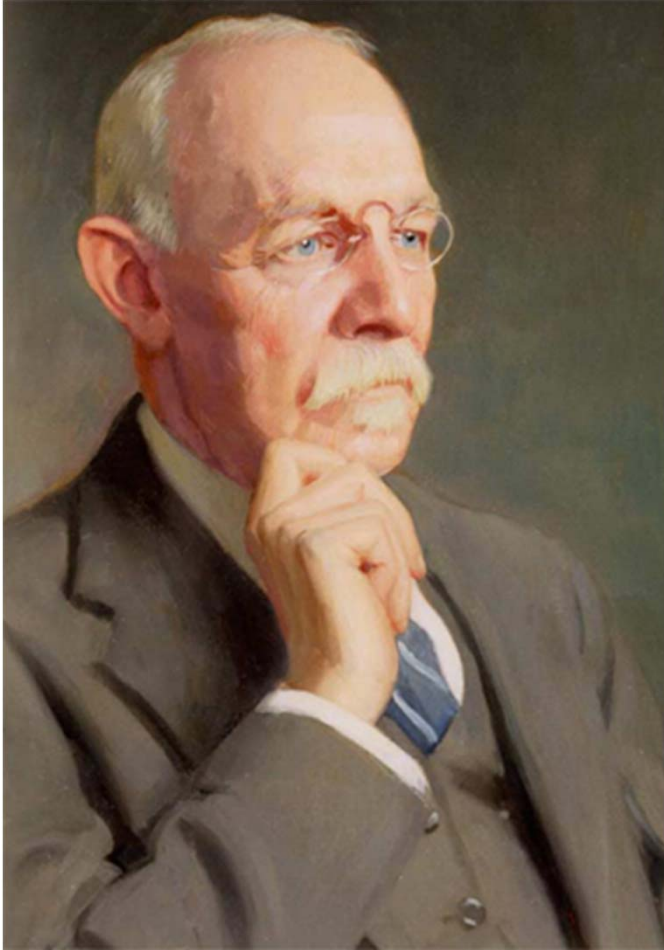
Kocher's contributions

- Initial mortality rate of 14.8%, down to 0.18%
- RLN injury rate less than 1%
- Principles that still hold true today:
 - Preserve the nerves
 - Preserve the parathyroid glands
 - Limit bleeding
 - Replace thyroid hormone appropriately
- Awarded Nobel Prize 1909



Theodor Kocher (1841-1917)

Halsted's perspective - 1920



William Halsted, MD (1852-1922)

- “The extirpation of the thyroid gland typifies, perhaps better than any other operation, the supreme triumph of the surgeon’s art...”

The history of the parathyroid glands



Sir Richard Owen, (1804-1892)

- First identification of parathyroid glands in animal occurred in 1849
- Autopsy on Indian rhinoceros at London Zoo performed by famed anatomist Richard Owen

First description of parathyroid glands in humans



IVAR SANDSTRÖM

- Swedish medical student Ivar Sandstrom was the first to describe parathyroid glands in human cadaver studies in 1880
- Function of glands and their role in calcium homeostasis gradually elucidated over next several decades

First parathyroidectomy ?



John Bland-Sutton, (1855-1936)

- Bland-Sutton, c.1917, operating on woman with airway obstruction: “I removed the rounded body, as big as a cherry, situated below the lower angle of the thyroid gland on the left side of the trachea. It had the microscopic features of a parathyroid”
- No evidence of parathyroid disease, no correlation with biochemical abnormalities

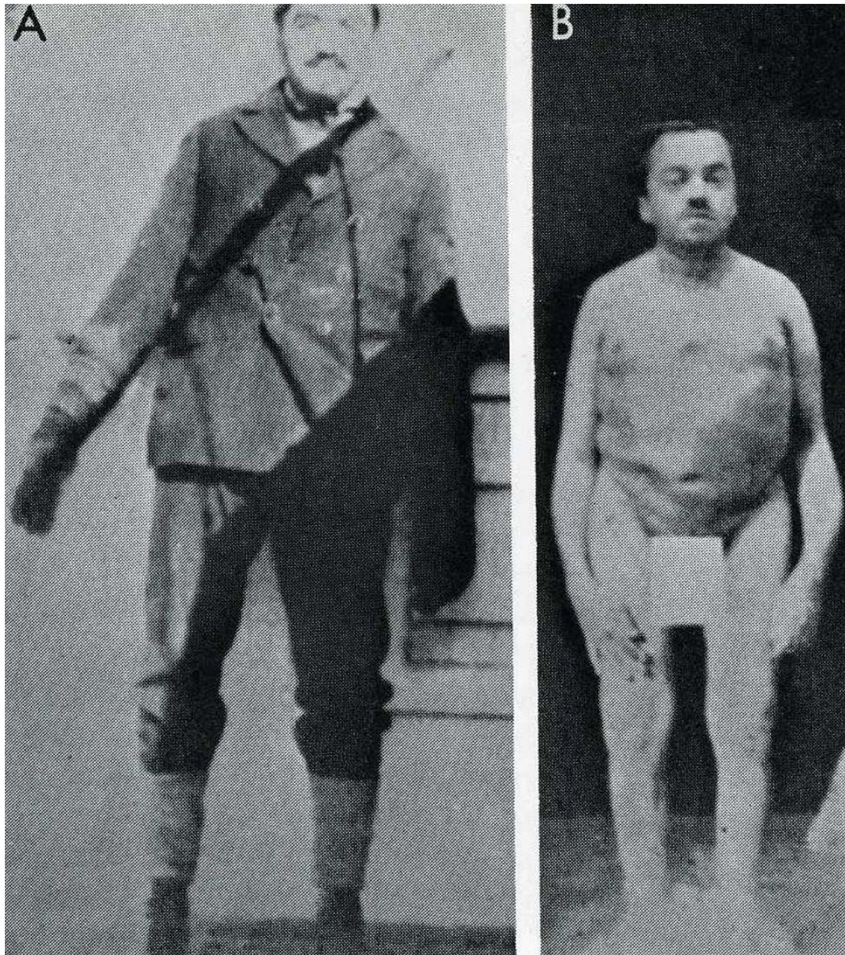
First parathyroidectomy*: Vienna, 1925



Felix Mandl, (1892-1957)

- 33 y.o. streetcar driver Albert Jahne diagnosed with primary hyperparathyroidism with resultant musculoskeletal effects
- Surgeon Felix Mandl performed bedside parathyroidectomy with excellent short-term results

First U.S. parathyroid operation: 1926



- Captain Charles Martell: rugged sailor, developed musculoskeletal complaints, lost many inches in height
- Diagnosed with primary hyperparathyroidism and treated at Massachusetts General Hospital
- Required 7 operations in total, finally found adenoma in mediastinum

From MGH to modern-day

- In the less than a century since first US parathyroidectomy, improvements in:
 - Biochemical testing
 - Radiologic localization
 - Operative techniques
 - Understanding of pathophysiology and natural history of the disease, as well as genetic syndromes



Conclusion

- While now routine, thyroidectomy and parathyroidectomy were once among the most challenging operations undertaken by surgeons
- Despite recent technologic advancements, same principles will always apply:
 - Be precise and meticulous in dissection
 - Understand relevant anatomy and pathophysiology of endocrine disease
 - Avoid injury to surrounding structures