



Historical Profile

Antonio Pacchioni: italian physician and anatomist

Italian physician and anatomist who identified the nodular formations involved in the reabsorption of CSF. He was born on June 24, 1664 in Reggio Emilia, Italy, and died on Nov 5, 1726 in Rome, Italy.

The physician Antonio Pacchioni (1664–1726) devoted many years to the study of anatomy. Three centuries after his death, his contributions remain essential to the field of neurology, particularly his pioneering studies on the structure of the meninges and the identification of nodular formations involved in the reabsorption of CSF, now eponymous in his honour (the Pacchionian granulations). Pacchioni's pioneering research substantially advanced the understanding of the dura mater, the outermost membrane enveloping the brain and spinal cord. His meticulous studies led to the first detailed descriptions of structures now known as arachnoid granulations or Pacchionian granulations, which have a crucial role in CSF dynamics.

Pacchioni was the son of Giambattista Dugoni, a modest craftsman, and Leonora. The family lived in relatively humble conditions in Reggio Emilia, Italy. He received his early education in the humanities which, in late 17th-century Italy, was a common route for those who wanted to become physicians, because classical studies were deemed essential to the development of moral character and intellectual rigour. He completed his medical studies on April 25, 1688, at the Studio Pubblico of Reggio Emilia, where he obtained a degree in medicine and philosophy.

In 1689, Pacchioni moved to Rome to improve his medical qualifications. There, under the guidance of the renowned anatomist Antonio Vallisneri, a member of the Royal Society of London, he worked at the hospital of Santo Spirito in Sassia. Afterwards, he worked at the Ospedale di San Giovanni in Laterano and at the Ospedale della Consolazione, where he gained extensive clinical experience.

In the late 1690s, he collaborated extensively with Marcello Malpighi (1628–94), another leading anatomist, who profoundly influenced his scientific pursuits. Being close to Malpighi enabled him to refine his anatomical techniques, which he applied both to human and animal samples, with the aid of a basic microscope. Pacchioni's primary research focus was the structure and function of the dura mater. Employing innovative techniques, such as the maceration of anatomical specimens in various fluids, like vinegar and alcohol, he meticulously studied this layer of the meninges. By softening the tissue, this procedure made it possible to properly separate and examine its fibre layers and related features. To improve this technique, he

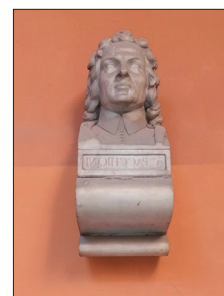
used microscopy, influenced by Malpighi's methods of scientific observation, that aimed at understanding both the structure and function of tissues.

In 1705, Pacchioni published his seminal work, *Dissertatio epistolaris de glandulis conglobatis durae meningis humanae*, wherein he provided the first comprehensive description of small protrusions of the arachnoid membrane penetrating the dura mater. These structures, later termed Pacchionian bodies or granulations, are vital for the reabsorption of CSF into the venous system. Pacchioni hypothesised that the dura mater possessed muscular properties similar to those of the heart, and postulated that the dura mater plays an active part in brain function. He thought that lymph could be secreted from the "glandulae" of the dura mater to lubricate the sliding movement between the meninges and the brain during contractions. Although this hypothesis was later contested, notably by Giorgio Baglivi (1668–1707), it underscores Pacchioni's commitment to integrating knowledge of an anatomical structure with its physiological function. Another seminal discovery was the description of the tentorial notch (also known as "Pacchioni's oval foramen"), an anatomical opening that allows the passage of cerebral peduncles and arteries between supratentorial and infratentorial compartments.

Throughout his career as an anatomist in Rome, Pacchioni collaborated with other prominent scientists, including Giovanni Maria Lancisi (1654–1720), who was pontifical archiatry of two popes (Innocenzo XI and Clemente XI), and founder of the Lancisi Academy of Rome. Lancisi encouraged his anatomical studies. Because of Lancisi's help, Pacchioni could do many clinical observations, dissect tissues postmortem, and gain access to medical instruments and an advanced work environment, especially at the Ospedale di Santo Spirito, one of Rome's top teaching hospitals at that time. Lancisi's backing had a crucial impact on Pacchioni's capacity to disseminate his *Dissertationes anatomicae de durae meningis fabricâ et usu* (1705), a publication that was printed with papal authority and dedicated to Cardinal Girolamo Casanate.

In 1705, Pacchioni was appointed head physician at the Ospedale di San Giovanni in Laterano, a position that allowed him to continue his clinical practice alongside his research endeavours until his death, on Nov 5, 1726. Pacchioni's meticulous studies laid the groundwork for future research into the meninges and CSF dynamics, leaving behind a legacy of scientific inquiry that continues to influence modern neuroscience.

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