

Thesis Title Scanning Electron Microscopic Study
 on Pituitary Vascular Casts of Common
 Tree Shrew (Tupaia glis)

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ABSTRACT

The microvascular cast technique in conjunction with scanning electron microscopy were used on the pituitary gland of the common tree shrew (Tupaia glis). The pituitary vascular casts were obtained by infusion of low viscosity methyl methacrylate plastic (Batson' no.17) mixture. The injections of red latex and red vinyl resin into the arterial system as well as the injection of blue vihyl resin into the venous system were also made to obtain the vascular casts leading to the study of gross arterial and venous supplies to the pituitary gland and related structures. Under ether anesthesia, the chest was opened, 0.05 ml of heparin was injected, the right atrium was cut open and 200-250 ml of 0.9 % NaCl solution was perfused, through the left ventricle. Then the red latex

or red vinyl resin or Batson's no.17 mixture was perfused manually at the rate of 8 ml/min, also through the left ventricle until it was flowing out from the right atrium, while the blue vinyl resin was perfused through the external jugular vein. After hardening, the latex injected specimens were dissected to expose the major arterial supplies to the pituitary gland and related organs. The specimens were examined by direct visualization and also under stereomicroscope. Meanwhile, the red vinyl resin, blue vinyl resin and plastic mixture injected specimens were corroded in 40% KOH. After washing in tap water and drying at room temperature, the red vinyl resin and blue vinyl resin corrosion casts were examined under stereomicroscope. The plastic corrosion casts of the pituitary were dissected, coated with carbon and gold or gold/palladium before viewing under a scanning electron microscope at an accelerating voltage of 15 and 20 kV. It was found that the blood supplies to the pituitary complex were from branches of circle of Willis and could be divided into two groups. The first or superior group consisted of 2 to 4 superior hypophyseal arteries branching off from the internal carotid artery and posterior communicating artery on each side supplying the median eminence, infundibular stalk and pars distalis. The superior hypophyseal arteries supply to the median eminence, by branching into deep (internal) and superficial (external) capillaries plexi. Each plexus was from the same and/or different superior hypophyseal

arteries. The internal plexus was with larger capillary size (approximately 20 μm in diameter), deeper in position, with denser and more complexity of capillary loops compared to those in the external plexus. The capillary size of the external plexus was approximately 10 μm in diameter. The two plexi drained into 15 to 20 long portal vessels (hypophyseal portal veins) which located along the inferior and inferolateral surfaces of the infundibular stem before breaking up into sinusoids (18 μm in diameter) with anteroposterior arrangement within the pars distalis. The infundibular stalk and the pars distalis was also supplied directly with arteries from the superior group. The second or inferior group comprised of one inferior hypophyseal artery on each side, it was branching off from the internal carotid artery. The arteries pierced the dorsolateral and ventrolateral aspects of infundibular process inside with they form a capillary plexus. They also sending off radiating capillaries to supply the pars intermedia surrounding the cortical area of the infundibular process. The area represented hypophyseal cleft seperating the pars intermedia from the pars distalis was clearly seen with very little blood vessels. The capillaries in both adenohypophysis and neurohypophysis are joined to form veins draining the blood into the cavernous sinus.