



MORPHOLOGICAL SHAPES OF PINEAL GLAND IN SOUTH INDIAN POPULATION - AUTOPSY STUDY

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ABSTRACT

Pineal gland is a neuroendocrine organ. It exists in different shapes in humans and often confuse the operating neurosurgeons in identifying the gland. We present our fresh autopsy study regarding various shapes of Pineal gland in south indian population

MATERIALS AND METHODS: The study conducted in department of forensic medicine and neurosurgery department from August 2018 to December 2018 on 50 fresh autopsy cases done within 48 hours after death before the onset of brain putrefaction. After the skull cap is removed, cerebral hemispheres harvested and pineal gland exposed by corpus callosotomy and studied.

RESULTS: The present study shows the commonest shape of the pineal gland is Pine cone in 24 cases, pea shaped in 15 cases, fusiform shaped in 9 cases, cone shaped one case and piriform shaped in two cases.

KEYWORDS : Pineal gland, Shape of Pineal gland, corpus callosotomy, Autopsy study

INTRODUCTION

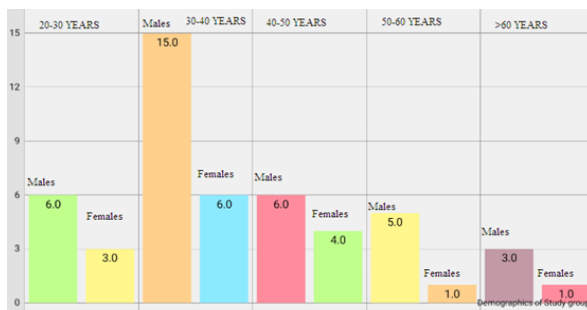
The exact function of pineal gland is still in confusion[1]. It's role about circadian rhythm, sleep pattern[2], connection with optic pathway are mentioned in the literature. Identification of Pineal gland itself is a difficult one due to it's various shapes[3] as normal anatomical variation, sometimes mistaken for brain tumour during surgery[4]. Therefore the present study is undertaken to document the variable shapes of Pineal gland in south Indian population.

MATERIALS AND METHODS

This is a fresh cadaver study with our Institutional ethical committee clearance. After getting consent from the relatives, by doing corpus callosotomy the posterior third ventricle is approached and pineal recess identified in the posterior third ventricular region. The Pineal gland identified above the superior colliculus[5] level and shape of the pineal gland noted and photographed. The trauma ,tumour, decomposed cases were excluded from the study. This study conducted from August 2018 to December 2018 on autopsies done within 48 hours of death and the study population is 50 cases.

RESULTS

Total number of cases-50(Males-25, Females-25). The most common shape observed in this study is Pine-cone shaped Pineal gland and the least common variety is cone shaped Pineal gland. The demographic distribution pattern plotted in the bar chart-1. The morphological pattern of Pineal gland depicted in the Pie chart-1. Various shapes of pineal gland described in the literature shown in Figure-1 and actual Autopsy images are shown in Figure-2.



Bar chart 1 showing the Age and Sex distribution of the study group



FIGURE-1. Various shapes of the Pineal gland 1-PEA 2- PINE CONE 3-FUSIFORM, 4-CONE, 5-PIRIFORM

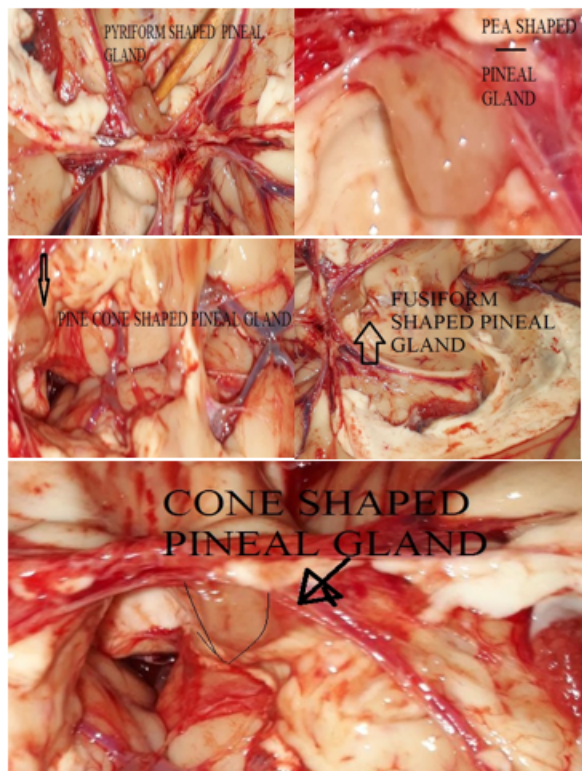
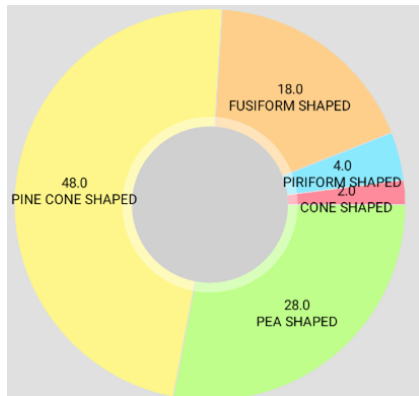


FIGURE-2. TYPES OF PINEAL GLAND BASED ON IT'S SHAPE



Pie chart-1. showing the pineal gland morphological pattern of Pineal gland in this study

DISCUSSION

Various authors reported differently about the shape of the Pineal gland. In present study only five shapes are observed. They are Pea, Pine-cone, fusiform, conical and piriform shapes. Even though the pineal region tumours situated at the geometric centre and all the surgical approach distances are same from the surface of brain, still the surgeries are very difficult even for the master neuro surgeons. The various neurosurgical approaches for Pineal region pathologies are infratentorial supracerebellar approach by Krause(1926), translateral ventricular approach by van Wagenen (1931), parafalcine trans-splenial approach by Dandy (1936) and occipital approach by Poppen (1966). Identification of the Pineal gland and it's anatomical variation are the two crucial steps in all these surgical approaches for complete tumour excision and to avoid iatrogenic injuries to the adjacent normal brain parenchyma.

Table 1. Shape of the Pineal gland according to various literatures

S.no	Author	Pineal gland shape
1	Wood &Enders et al(6),Fawcett et al(1994)[7]	Cone
2	Berkovitz & Moxham et al (1988)[8]	Fusiform
3	Williams et al. (1989)[9]	Piriform
4	Rogers &Jacob (1992)[10]	Pea shaped
5	Docherty(2007)[11], Nolte(2009) et al[12].Ross & Pawlina (2011)[1], and Gartner & Hiatt (2014)[13],	Pine-cone
6	Mescher (2013)[14]	Flattened cone

RESULTS

The present study shows the commonest shape of the pineal gland is Pine-cone in 24 cases, pea shaped in 15 cases, fusiform shaped in 9 cases, cone shaped in one case and piriform shaped in two cases. This south Indian population based autopsy study presented to help young Neurosurgeons to identify the Pineal gland without doubt during surgeries in the posterior third ventricular and Pineal region.

CONFLICT OF INTEREST: None to declare

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