Perbedaan Antara Gambaran Vestibular Schwannoma Dengan Meningioma Cerebellopontine Angle Pada
Pemeriksaan Magnetic Resonance Imaging
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# PERBEDAAN ANTARA GAMBARAN *VESTIBULAR SCHWANNOMA* DENGAN MENINGIOMA *CEREBELLOPONTINE ANGLE* PADA PEMERIKSAAN *MAGNETIC RESONANCE IMAGING*

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## ABSTRAK

**Latar belakang:** Lesi *cerebellopontine angle* (*CPA*) memiliki prevalensi rendah, tetapi penting secara klinis karena *vestibular schwannoma* dan *meningioma CPA* sering memiliki manifestasi klinis dan gambaran radiologis yang tumpang tindih. Pembedaan praoperatif kedua lesi penting untuk menentukan strategi terapi, pendekatan bedah, dan prediksi morbiditas fungsional. Penelitian ini bertujuan membandingkan gambaran MRI antara *vestibular schwannoma* dan *meningioma CPA*.

**Metode:** Penelitian ini merupakan penelitian analitik observasional dengan desain *cross sectional* dan pengambilan data retrospektif pada pasien dewasa dengan massa *CPA* yang menjalani MRI kepala dengan kontras di RSUP Dr. Sardjito Yogyakarta periode Januari 2024 - Desember 2025. Fitur MRI dianalisis oleh dua dokter spesialis radiologi, kemudian dilakukan analisis komparatif.

**Hasil:** Penelitian melibatkan 117 subjek penelitian, terdiri atas 70 *vestibular schwannoma* dan 47 meningioma. Tidak terdapat perbedaan bermakna pada usia, sisi lesi, volume tumor, maupun manifestasi klinis utama, sedangkan jenis kelamin berbeda bermakna antara kedua kelompok ($p$ = 0,044). *Vestibular schwannoma* secara signifikan lebih sering melibatkan kanalis akustikus interna, berbentuk *lobulated*, memiliki komponen solid-kistik atau kistik, menunjukkan sinyal T1 hipointens, *enhancement* heterogen, kista intratumoral, serta perdarahan intratumoral. Meningioma lebih sering berbentuk bulat, solid, isointens pada T1, dan menunjukkan *enhancement* homogen. Perbedaan signifikan ditemukan pada keterlibatan kanalis akustikus interna, bentuk, komponen tumor, sinyal T1, pola *enhancement*, kista intratumoral, dan perdarahan intratumoral ($p$ < 0,05). Tidak terdapat perbedaan bermakna pada sinyal T2, sinyal DWI, edema serebelum, dan kalsifikasi intratumoral ($p$ > 0,05).

**Kesimpulan**: Kombinasi karakteristik morfologi, komponen internal, sinyal T1, pola *enhancement*, keterlibatan kanalis akustikus interna, kista, dan perdarahan intratumoral membantu membedakan *vestibular schwannoma* dari *meningioma CPA* pada MRI.

**Kata kunci**: *Neuroma, Acoustic*; *Meningioma*; *Cerebellopontine Angle*; *Magnetic Resonance Imaging*.

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# *DIFFERENCES IN MAGNETIC RESONANCE IMAGING FEATURES BETWEEN VESTIBULAR SCHWANNOMA AND CEREBELLOPONTINE ANGLE MENINGIOMA*

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## ABSTRACT

***Background**: Cerebellopontine angle (CPA) lesions have a low prevalence but are clinically important because vestibular schwannomas and CPA meningiomas often have overlapping clinical manifestations and radiological features. Preoperative differentiation of these two lesions is crucial for determining therapeutic strategies, surgical approaches, and predicting functional morbidity. This study aimed to compare MRI features between vestibular schwannomas and CPA meningiomas.*

***Methods**: This was an observational, analytical study with a cross-sectional design and retrospective data collection in adult patients with CPA masses who underwent contrast-enhanced head MRI at Dr. Sardjito General Hospital, Yogyakarta, between January 2024 and December 2025. MRI features were analyzed by two radiologists, followed by a comparative analysis.*

***Results**: The study involved 117 subjects, consisting of 70 vestibular schwannomas and 47 meningiomas. There were no significant differences in age, lesion site, tumor volume, or primary clinical manifestations, while gender was significantly different between the two groups ($p = 0.044$). Vestibular schwannomas were significantly more likely to involve the internal auditory canal, were lobulated, had a solid-cystic or cystic component, showed hypointense T1 signal, heterogeneous enhancement, intratumoral cysts, and intratumoral hemorrhage. Meningiomas were more often round, solid,* isointens *on T1, and showed homogeneous enhancement. Significant differences were found in internal auditory canal involvement, shape, tumor component, T1 signal, enhancement pattern, intratumoral cysts, and intratumoral hemorrhage ($p < 0.05$). There were no significant differences in T2 signal, DWI signal, cerebellar edema, and intratumoral calcification ($p > 0.05$).*

***Conclusion**: The combination of morphological characteristics, internal components, T1 signal, enhancement pattern, internal acoustic canal involvement, cysts, and intratumoral hemorrhage helps differentiate vestibular schwannoma from CPA meningioma on MRI.*

***Keywords***: *Neuroma, Acoustic*; *Meningioma*; *Cerebellopontine Angle*; *Magnetic Resonance Imaging*.