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Korelasi Ketebalan dan Panjang Ossification Posterior Longitudinal Ligament Vertebrae Servikal dengan Diameter Anteroposterior Kanalis Spinalis Menggunakan Magnetic Resonance Imaging
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KORELASI KETEBALAN DAN PANJANG *OSSIFICATION POSTERIOR LONGITUDINAL LIGAMENT* VERTEBRAE SERVIKAL DENGAN DIAMETER *ANTEROPOSTERIOR* KANALIS SPINALIS MENGGUNAKAN *MAGNETIC RESONANCE IMAGING*

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ABSTRAK

Latar Belakang: *Ossification of posterior longitudinal ligament* (OPLL) servikal merupakan osifikasi patologis ligamentum longitudinal posterior yang dapat menyempitkan kanalis spinalis dan menimbulkan kompresi medula spinalis. Penilaian morfometri OPLL dan diameter anteroposterior (AP) kanalis spinalis menggunakan *magnetic resonance imaging* (MRI) dapat membantu menggambarkan derajat keterlibatan medula spinalis.
Tujuan: Penelitian ini bertujuan untuk mengetahui korelasi antara ketebalan dan panjang *ossification posterior longitudinal ligament* vertebrae *servikal* dengan diameter anteroposterior kanalis spinalis menggunakan *magnetic resonance imaging* di RSUP Dr. Sardjito.
Metode: Penelitian analitik observasional korelatif dengan rancangan *cross-sectional* retrospektif dilakukan pada pasien dewasa dengan OPLL servikal yang menjalani MRI servikal di RSUP Dr. Sardjito Yogyakarta periode 1 Januari 2024-31 Maret 2026. Sebanyak 53 subjek dianalisis. Ketebalan OPLL maksimal dan rerata, panjang OPLL, diameter AP kanalis spinalis tersempit, serta derajat kompresi medula spinalis diukur pada MRI. Reliabilitas interobserver dinilai menggunakan *intraclass correlation coefficient* dan *Cohen's kappa*, sedangkan korelasi antarvariabel dianalisis menggunakan uji Spearman. Analisis tambahan menggunakan regresi logistik dilakukan untuk menilai hubungan ketebalan OPLL maksimal dan rerata, panjang OPLL, serta diameter AP kanalis spinalis tersempit dengan kelompok derajat kompresi medula spinalis berdasarkan klasifikasi Kang (grade 0–1 dan grade 2–3). Nilai $p<0,05$ dianggap bermakna secara statistik.
Hasil: Rerata usia subjek 57,23 ± 11,63 tahun, 52,8% laki-laki, dan rerata indeks massa tubuh 24,34 ± 2,98 kg/m². Seluruh parameter menunjukkan reliabilitas interobserver kuat dengan ICC/Kappa 0,915-0,998. Rerata diameter AP kanalis spinalis tersempit sebesar 8,38 ± 2,28 mm; 26,4% subjek termasuk *grade* 0-1 dan 73,6% *grade* 2-3. Median ketebalan OPLL maksimal 4,23 mm, rerata ketebalan OPLL 3,88 ± 1,15 mm, dan median panjang OPLL 26,40 mm. Ketebalan OPLL maksimal berkorelasi negatif lemah dan signifikan dengan diameter AP kanalis spinalis tersempit ($\rho=-0,384$; $p=0,004$), demikian pula ketebalan OPLL rerata ($\rho=-0,384$; $p=0,004$). Panjang OPLL tidak menunjukkan korelasi signifikan ($\rho=-0,217$; $p=0,119$). Pada analisis regresi logistik, baik ketebalan OPLL maksimal dan rerata, panjang OPLL, maupun diameter AP kanalis spinalis tersempit tidak menunjukkan

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hubungan independen yang bermakna dengan kelompok derajat kompresi medula spinalis (seluruh p>0,05).
Kesimpulan: Ketebalan OPLL maksimal dan rerata berkorelasi negatif lemah secara bermakna dengan diameter anteroposterior kanalis spinalis tersempit, sedangkan panjang OPLL tidak menunjukkan korelasi yang bermakna. Namun, pada analisis regresi logistik, keempat parameter tersebut belum menunjukkan hubungan independen yang bermakna dengan kelompok derajat kompresi medula spinalis.
Kata kunci: *Ossification of Posterior Longitudinal Ligament*; *Vertebra servikal*; *Spinal Canal*; *Spinal Cord Compression*; *Magnetic Resonance Imaging*.

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ABSTRACT

Background: *Cervical posterior longitudinal ligament (OPLL) ossification is a pathological ossification of the posterior longitudinal ligament that can narrow the spinal canal and cause spinal cord compression. Assessment of the OPLL morphometry and the anteroposterior (AP) diameter of the spinal canal using magnetic resonance imaging (MRI) can help describe the degree of spinal cord involvement.*

Objective: *This study aimed to determine the correlations of OPLL thickness and length with the anteroposterior diameter of the spinal canal on cervical MRI at Dr. Sardjito General Hospital.*

Methods: *A retrospective cross-sectional, correlative observational analytic study was conducted in adult patients with cervical OPLL who underwent cervical MRI at Dr. Sardjito General Hospital Yogyakarta from January 1, 2024 to March 31, 2026. A total of 53 subjects were analyzed. The maximum and mean OPLL thickness, OPLL length, narrowest spinal canal AP diameter, and degree of spinal cord compression were measured on MRI. Interobserver reliability was assessed using the intraclass correlation coefficient and Cohen's kappa, while correlation between variables was analyzed using the Spearman test with $p<0.05$. Additional multivariable logistic regression examined associations with Kang grades 0–1 versus 2–3. A p-value <0.05 was considered statistically significant.*

Results: *The mean age of the subjects was 57.23 ± 11.63 years, 52.8% were male, and the mean body mass index was 24.34 ± 2.98 kg/m². All parameters showed strong interobserver reliability with ICC/Kappa 0.915-0.998. The mean AP diameter of the narrowest spinal canal was 8.38 ± 2.28 mm; 26.4% of subjects were classified as Kang grades 0–1 and 73.6% as grades 2–3. The median maximum OPLL thickness was 4.23 mm, the mean OPLL thickness was 3.88 ± 1.15 mm, and the median OPLL length was 26.40 mm. The maximum OPLL thickness had a weak and significant negative correlation with the narrowest AP diameter of the spinal canal (ρ = -0.384; p = 0.004), as did the mean OPLL thickness (ρ = -0.384; p = 0.004). The OPLL length did not show a significant correlation (ρ = -0.217; p = 0.119). None of the four evaluated parameters showed a statistically significant independent association with spinal cord compression category in the multivariable analysis (all p > 0.05).*

Conclusion: *Maximum and mean OPLL thickness showed weak but statistically significant negative correlations with the narrowest AP diameter of the spinal canal, indicating that greater OPLL thickness was associated with a narrower*

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spinal canal. OPLL length was not significantly correlated with the narrowest AP spinal canal diameter. However, none of the evaluated parameters showed a statistically significant independent association with spinal cord compression category in the multivariable analysis.

Keywords: *Ossification of Posterior Longitudinal Ligament; Cervical Vertebrae; Spinal Canal; Spinal Cord Compression; Magnetic Resonance Imaging.*