

## BÖLÜM 17



# Hipertrofik Kardiyomyopati ve Atrial Fibrilasyon

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## GİRİŞ

Hipertrofik kardiyomyopati (HKMP), genel popülasyonda yaklaşık 400 kişiden 1'ini etkileyen, en yaygın kalitsal kalp hastalığıdır (1). Tanım olarak bakıldığındır HKMP; aort darlığı, sistemik hipertansiyon gibi herhangi bir yüklenme durumu yokluğunda ventrikül duvar kalınlığında artış (>15 mm veya pozitif genetik test veya HKMP tanılı aile üyesi varlığında >13 mm) ile karakterizedir (2,3). Atrial fibrilasyon (AF) ise HKMP hastalarında en sık görülen devamlı aritmıdır (4,5). Genel popülasyon ile karşılaştırıldığında HKMP hastaları yaşamaları boyunca 4 ila 6 kat fazla AF gelişme riskine sahiptir (6,7).

AF'nin bu hasta grubunda daha sık görülmemesine ilave olarak, daha erken yaşlarda ortaya çıkma eğiliminde olduğu gösterilmiştir (8). Sinüs ritmindeki ve AF olan HKMP hastaları karşılaştırıldığında, AF olanlarda 4 kat artmış ölüm riski bulunmaktadır (9). İnme ve tromboembolik olaylar en yaygın komplikasyonlardır ve iskemik strok 8 kat fazla izlenmektedir (8).

## PATOFİZYOLOJİ

HKMP'nin patogenezi, sarkomer proteinlerinde yapısal değişikliklere neden olan ve kalbin kas hücresi boyutunun artmasına neden olan mutasyonlar ile açıklanmaktadır (10). Mutasyonlar, kalp kası hücrelerinin yapısal bileşenlerinde fibrozu hızlandıran ve interventriküler septumun kalınlığını artıran hücresel bir düzensizliğe neden olur (11). Mutasyonların neden olduğu bu değişiklikler LVOT obstrüksiyonuna (LVOTO), sistolde LV end sistolik volüm artısına neden olur. Ayrıca, HKMP hastalarında sıkılıkla atrial iskemi ve mikrovasküler disfonksiyona bağlı artan miktarda atrial fibrozis ile karşılaşılır, bu da atrial genişlemeye ve fonksiyon bozukluğuna katkıda bulunur (12). Son olarak, genetik faktörler de LA remodelingini modüle ederek AF insidansında rol oynayabilir (13).

Son zamanlarda spesifik sarkomerik gen mutasyonları, HKMP popülasyonunda AF'nin daha erken başlamasıyla ilişkilendirilmiştir (14). Ayrıca, çoğunlukla renin anjiyotensin-al-

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atriyal boyut ve AF tipi, AF nüksünün güçlü öngörülerinden biridir. Yapılan çalışmalarda uzun dönem başarı oranı %76.7 bulunmuştur. Antiaritmik ilaç tedavisi almadan 1.yilda ve en son takipte başarı oranı %69.45 ve %50.4'tür (38, 40-42).

Eşzamanlı septal miyektomi sırasında cerrahi ablasyon yapılan birçalışmada ise 1 yıl ve 6 yıllık takipte; sırasıyla  $\%96 \pm 3.5$  ve  $\%80 \pm 8.1$  oranında aritmi kontrolü sağlanmıştır (43).

Cox-maze-III, Cox-maze IV veya PVI prosedürleri ile kombine edilen septal miyektomi sonuçlarının incelendiği başka bir çalışmada 5 yıllık AF nüksü %48 olarak tespit edilmiştir (44).

## SONUÇ

AF, HKMP hastalarında sık görülen bir olaydır ve aynı zamanda olumsuz bir прогноз ile ilişkilidir. Gelişiminin nedenleri, HKMP ve genetik faktörlerle ilişkili tipik anatomik ve hemodinamik değişiklikler de dahil olmak üzere çok faktörlüdür. Klinisyenler, hastalarla yapılan düzenli takipler sırasında bu aritmiye karşı yüksek şüphe duymalı ve dikkatli olmalıdır.

## KAYNAKLAR

44. Husser D, Ueberham L, Jacob J, et al. Prevalence of clinically apparent hypertrophic cardiomyopathy in Germany—an analysis of over 5 million patients. *PLoS One*. 2018;13(5):e0196612.
45. Olivotto I, d'Amati G, Basso C, et al. Defining phenotypes and disease progression in sarcomeric cardiomyopathies: contemporary role of clinical investigations. *Cardiovasc Res*. 2015;105(4):409e423.
46. Elliott PM, Anastasakis A, Borger Michael A, et al, Authors/Task Force members. ESC Guidelines on diagnosis and management of hypertrophic cardiomyopathy: the Task Force for the Diagnosis and Management of Hypertrophic Cardiomyopathy of the European Society of Cardiology (ESC). *Eur Heart J*. 2014;35(39):2733e2779.
47. Vaidya K, Semsarian C and Chan KH. Atrial fibrillation in hypertrophic cardiomyopathy. *Heart Lung Circ* 2017; 26: 975-982.
48. El-Battrawy I, Borggrefe M and Akin I. Atrial fibrillation in hypertrophic cardiomyopathy. *JACC Heart Fail* 2018; 6: 807.
49. Guttmann OP, Rahman MS, O'Mahony C, Anastasakis A, Elliott PM. Atrial fibrillation and thromboembolism in patients with hypertrophic cardiomyopathy: systematic review. *Heart* 2014;100:465-472.
50. Davis RC, Hobbs FDR, Kenkre JE, Roalfe AK, Iles R, Lip GYH, Davies MK. Prevalence of atrial fibrillation in the general population and in high-risk groups: the ECHOES study. *Europace* 2012;14:1553–1559.
51. Olivotto I, Cecchi F, Casey SA, Dolara A, Traverse JH, Maron BJ. Impact of atrial fibrillation on the clinical course of hypertrophic cardiomyopathy. *Circulation*. 2001;104(21):2517-2524.
52. Sontius KC, Geske JB, Ong K, et al. Atrial fibrillation in hypertrophic cardiomyopathy: prevalence, clinical correlations, and mortality in a large high-risk population. *J Am Heart Assoc*. 2014;3:e001002.
53. Marian AJ, Braunwald E: Hypertrophic cardiomyopathy: genetics, pathogenesis, clinical manifestations, diagnosis, and therapy. *Circ Res*. 2017, 121:749-70.
54. Brigden W: Hypertrophic cardiomyopathy. *Br Heart J*. 1987, 58:299-302.
55. Habibi M, Lima JA, Khurram IM, Zimmerman SL, Zipunnikov V, Fukumoto K, Spragg D, Ashikaga H, Rickard J, Marine JE, Calkins H and Nazarian S. Association of left atrial function and left atrial enhancement in patients with atrial fibrillation: cardiac magnetic resonance study. *Circ Cardiovasc Imaging* 2015; 8: e002769.
56. Bongini C, Ferrantini C, Girolami F, Coppini R, Arretini A, Targetti M, Bardi S, Castelli G, Torricelli F, Cecchi F, Ackerman MJ, Padeletti L, Poggesi C and Olivotto I. Impact of genotype on the occurrence of atrial fibrillation in patients with hypertrophic cardiomyopathy. *Am J Cardiol* 2016; 117: 1151-1159
57. Girolami F, Iascone M, Tomberli B, Bardi S, Benelli M, Marseglia G, Pescucci C, Pezzoli L, Sana ME, Basso C, Marziliano N, Merlini PA, Fornaro A, Cecchi F, Torricelli F and Olivotto I. Novel alpha-actinin 2 variant associated with familial hypertrophic cardiomyopathy and juvenile atrial arrhythmias: a massively parallel sequencing study. *Circ Cardiovasc Genet* 2014; 7: 741-750.
58. Orenes-Pinero E, Hernandez-Romero D, Romero-Aniorte AI, Martinez M, Garcia-Honrubia A, Caballero L, Garrigos-Gomez N, Andreu-Cayuelas JM, Gonzalez J, Feliu E, Climent V, Nicolas-Ruiz F, De La Morena G, Valdes M, Lip GY and Marin F. Prognostic value of two polymorphisms in non-sarcomeric genes for the development of atrial fibrillation in patients with hypertrophic cardiomyopathy. *QJM* 2014; 107: 613-621
59. Debonnaire Philippe, Joyce Emer, Hiemstra Yasmine, et al. Left Atrial Size and Function in Hypertrophic Cardiomyopathy Patients and Risk of New-Onset Atrial Fibrillation. *Circ Arrhythm Electrophysiol*. 2017 Feb;10(2):e004052.
60. Guttmann Oliver P, Pavlou Menelaos, O'Mahony Constantinos, et al. Hypertrophic Cardiomyopathy

- Outcomes Investigators. Predictors of atrial fibrillation in hypertrophic cardiomyopathy. *Heart.* 2017 May;103(9):672e678.
61. Zegkos Thomas, Efthimiadis Georgios K, Parcharidou Despoina G, et al. Atrial fibrillation in hypertrophic cardiomyopathy: A turning point towards increased morbidity and mortality. *Hellenic J Cardiol.* Sep-Oct 2017;58(5):331e339.
  62. Carrick Richard T, Maron Martin S, Adler Arnon, et al. Development and Validation of a Clinical Predictive Model for Identifying Hypertrophic Cardiomyopathy Patients at Risk for Atrial Fibrillation. The HCM-AF Score Circ Arrhythm Electrophysiol. 2021 Jun;14(6):e009796.
  63. Gersh BJ, Maron BJ, Bonow RO, Dearani JA, Fifer MA, Link MS, Naidu SS, Nishimura RA, Ommen SR, Rakowski H, Seidman CE, Towbin JA, Udelson JE and Yancy CW; American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Developed in collaboration with the American Association for Thoracic Surgery, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. *J Am Coll Cardiol* 2011; 58: e212-260.
  64. Garg L, Gupta M, Sabzwari SRA, Agrawal S, Agarwal M, Nazir T, Gordon J, Bozorgnia B and Martinez MW. Atrial fibrillation in hypertrophic cardiomyopathy: prevalence, clinical impact, and management. *Heart Fail Rev* 2019; 24: 189-197.
  65. Kirchhof P, Benussi S, Kotecha D, Ahlsson A, Atar D, Casadei B, Castella M, Diener HC, Heidbuchel H, Hendriks J, Hindricks G, Manolis AS, Oldgren J, Pojeski BA, Schotten U, Van Putte B, Vardas P, Agewall S, Camm J, Baron Esquivias G, Budts W, Carerj S, Casselma F, Coca A, De Caterina R, Deftereos S, Dobrev D, Ferro JM, Filippatos G, Fitzsimons D, Gorenek B, Guenoun M, Hohnloser SH, Kohl P, Lip GY, Manolis A, McMurray J, Ponikowski P, Rosenhek R, Ruschitzka F, Savelieva I, Sharma S, Suwalski P, Tamargo JL, Taylor CJ, Van Gelder IC, Voors AA, Windecker S, Zamorano JL, Zeppenfeld K (2016) 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. *Eur J Cardiothorac Surg* 50(5):e1– e88. Barnes PJ, Liu SF. Regulation of pulmonary vascular tone. *Pharmacol Rev* no;47(1):87-131. [27] Richardson JB. Nerve supply to the lungs. *Am Rev Respir Dis* no;119(5):785-802.
  66. Spoladore R, Maron MS, D'Amato R, Camici PG and Olivotto I. Pharmacological treatment options for hypertrophic cardiomyopathy: high time for evidence. *Eur Heart J* 2012; 33: 1724- 1733.
  67. Ammirati E, Contri R, Coppini R, Cecchi F, Frigerio M and Olivotto I. Pharmacological treatment of hypertrophic cardiomyopathy: current practice and novel perspectives. *Eur J Heart Fail* 2016; 18: 1106-1118.
  68. Tendera M, Wycisk A, Schneeweiss A, Polonski L and Wodniecki J. Effect of sotalol on arrhythmias and exercise tolerance in patients with hypertrophic cardiomyopathy. *Cardiology* 1993; 82: 335-342.
  69. Robinson K, Frenneaux MP, Stockins B, Karatasakis G, Poloniecki JD and McKenna WJ. Atrial fibrillation in hypertrophic cardiomyopathy: a longitudinal study. *J Am Coll Cardiol* 1990; 15: 1279-1285.
  70. Spoladore R, Fragasso G, Pannone L, Slavich M and Margonato A. Pharmacotherapy for the treatment of obstructive hypertrophic cardiomyopathy. *Expert Opin Pharmacother* 2020; 21: 233-242.
  71. Sherrid MV, Barac I, Maron BJ, et al. Multicenter study of the efficacy and safety of disopyramide in obstructive hypertrophic cardiomyopathy. *J Am Coll Cardiol.* 2005;45:1251-1258.
  72. Task Force members, Brignole M, Vardas P, Hoffman E, Huikuri H, Moya A, Ricci R, Sulke N, Wieling W; EHRA Scientific Documents Committee, Auricchio A, Lip GY, Almendral J, Kirchhof P, Aliot E, Gasparini M, Braunschweig F; Document Reviewers, Lip GY, Almendral J, Kirchhof P and Botto GL; EHRA Scientific Documents Committee. Indications for the use of diagnostic implantable and external ECG loop recorders. *Europace* 2009; 11: 671-687.
  73. Guttmann OP, Pavlou M, O'Mahony C, Monserrat L, Anastasaki A, Rapezzi C, Biagini E, Gimeno JR, Limongelli G, Garcia-Pavia P, McKenna WJ, Omar RZ and Elliott PM; Hypertrophic Cardiomyopathy Outcomes Investigators. Prediction of thrombo-embolic risk in patients with hypertrophic cardiomyopathy (HCM Risk-CVA). *Eur J Heart Fail* 2015; 17: 837-845.
  74. Ommen Steve R, Mital Seema, Burke Michael A, et al. 2020 AHA/ACC Guideline for the Diagnosis and Treatment of Patients With Hypertrophic Cardiomyopathy. A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation.* 2020;142.
  75. Maron BJ, Olivotto I, Bellone P, Conte MR, Cecchi F, Flygenring BP, Casey SA, Gohman TE, Bongioanni S, Spirito P (2002) Clinical profile of stroke in 900 patients with hypertrophic cardiomyopathy. *J Am Coll Cardiol* 39(2):301-307
  76. Giugliano RP, Ruf CT, Braunwald E, Murphy SA, Wiviott SD, Halperin JL, Waldo AL, Ezekowitz MD, Weitz JI, Spinar J, Ruzyllo W, Ruda M, Koretsune Y, Betcher J, Shi M, Grip LT, Patel SP, Patel I, Hanyok JJ, Mercuri M, Antman EM (2013) Edoxaban versus warfarin in patients with atrial fibrillation. *New Engl J Med* 369(22):2093-2104
  77. Granger CB, Alexander JH, McMurray J JV, Lopes RD, Hylek EM, Hanna M, Al-Khalidi HR, Ansell J, Atar D, Avezum A, Bahit MC, Diaz R, Easton JD, Ezekowitz JA, Flaker G, Garcia D, Gerald M, Gersh BJ, Golitsyn S, Goto S, Hermosillo AG, Hohnloser SH, Horowitz J, Mohan P, Jansky P, Lewis BS, Lopez-Sendon JL, Pais P, Parkhomenko A, Verheugt FWA, Zhu J, Wallentin L (2011) Apixaban versus warfarin in patients with atrial fibrillation. *New Engl J Med* 365(11):981-992
  78. Patel MR, Mahafey KW, Garg J, Pan G, Singer DE, Hacke W, Breithardt G, Halperin JL, Hankey GJ, Piccini JP, Becker RC, Nessel CC, Paolini JF, Berkowitz SD,

- Fox KAA, Calif RM (2011) Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. *New Engl J Med* 365(10):883–891
79. Connolly SJ, Ezekowitz MD, Yusuf S, Eikelboom J, Oldgren J, Parekh A, Pogue J, Reilly PA, Themeles E, Varrone J, Wang S, Alings M, Xavier D, Zhu J, Diaz R, Lewis BS, Darius H, Diener H, Joyner CD, Wallentin L (2009) Dabigatran versus warfarin in patients with atrial fibrillation. *New Engl J Med* 361(12):1139–1151
80. Zhou Y, He W, Zhou Y, Zhu W (2019) Non vitamin K antagonist oral anticoagulants in patients with hypertrophic cardiomyopathy and atrial fibrillation: a systematic review and meta analysis. *Journal of Thrombosis and Thrombolysis* volume 50, pages311–317
81. Santangeli P, Di Biase L, Themistoclakis S, Raviele A, Schweikert RA, Lakkireddy D, Mohanty P, Bai R, Mohanty S, Pump A, Beheiry S, Hongo R, Sanchez JE, Gallinghouse GJ, Horton R, Dello Russo A, Casella M, Fassini G, Elayi CS, Burkhardt JD, Tondo C and Natale A. Catheter ablation of atrial fibrillation in hypertrophic cardiomyopathy: long-term outcomes and mechanisms of arrhythmia recurrence. *Circ Arrhythm Electrophysiol* 2013; 6: 1089-1094
82. Bassiouny M, Lindsay BD, Lever H, Saliba W, Klein A, Banna M, Abraham J, Shao M, Rickard J, Kanj M, Tchou P, Dresing T, Baranowski B, Bhargava M, Callahan T, Tarakji K, Cantillon D, Hussein A, Marc Gillinov A, Smedira NG and Wazni O. Outcomes of nonpharmacologic treatment of atrial fibrillation in patients with hypertrophic cardiomyopathy. *Heart Rhythm* 2015; 12: 1438–1447.
83. Yan Q, Dong J-Z, Long D-Y, et al. Effectiveness of catheter ablation of atrial fibrillation in patients with hypertrophic cardiomyopathy. *Chin J Cardiac Arrythm.* 2013;3:167–171.
84. Zhou L, Ma J-W, Liu X, Zhao L et al. Catheter ablation of atrial fibrillation in patients with hypertrophic cardiomyopathy. *Chin J Cardiac Arrythm.* 2013;17:414–417.
85. Lin G, Lu HH, Shen Y, Huang JF, et al. Meta-analysis of the therapeutic effects of various methods for the treatment of chronic atrial fibrillation. *Exp Ther Med.* 2013;6:489–496.
86. Lapenna Elisabetta, Alberto Pozzoli, De Bonis Michele, et al. Mid-term outcomes of concomitant surgical ablation of atrial fibrillation in patients undergoing cardiac surgery for hypertrophic cardiomyopathy. *Eur J Cardio Thorac Surg.* 2017 Jun 1;51(6):1112e1118.
87. Hodges Kevin, Tang Andrew, Rivas Carlos G, et al. Surgical ablation of atrial fibrillation in hypertrophic obstructive cardiomyopathy: Outcomes of a tailored surgical approach. *J Card Surg.* 2020 Nov;35(11):2957e2964.