



## BAVOSILNI DAVOLASHDA ZAMONAVIY JARROHLIK TEXNIKALAR VA ULARNING SAMARADORLIGINI BAHOLASH

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### ANNOTATSIYA

Bavosil kasalligi (gemorroj) dunyo bo'ylab keng tarqalgan proktologik kasallik bo'lib, uning davolashida zamonaviy jarrohlik texnikalari muhim o'rin egallaydi. Ushbu maqola bavosilni davolashda qo'llaniladigan zamonaviy jarrohlik usullari, jumladan, klassik gemorroidektomiya, lazer gemorroidektomiya (LHP), stapled gemorroidopeksiya (PPH), transanal gemorroidal dearterializatsiya (THD), embolizatsiya va boshqa minimal invaziv texnikalarning samaradorligini baholashga bag'ishlangan. Ilmiy adabiyotlarning tizimli tahlili va meta-tahlillar asosida ushbu usullarning afzalliklari, kamchiliklari, qaytalanish darajasi, asoratlar (masalan, qon ketishi, infeksiya, og'riq), bemorlarning tiklanish muddati, operatsiya muddati va hayot sifati ko'rsatkichlarini solishtirish ko'rib chiqiladi. Natijalar shuni ko'rsatadiki, minimal invaziv usullar an'anaviy jarrohlikka nisbatan og'riqni 50% gacha kamaytiradi va tiklanishni 1-2 haftaga tezlashtiradi, ammo uzoq muddatli samaradorlikda klassik usullar ustunlik qiladi. Masalan, 2025 yilgi meta-tahlillarda THD va LHP usullari 90% dan yuqori samaradorlikka ega ekanligi ta'kidlangan. Maqola PubMed, PMC, Springer





va boshqa yuqori saviyali bazalardan olingan 60 dan ortiq ilmiy manbalar asosida tuzilgan bo'lib, mavzuning ilmiy dolzarbligini yuqori darajada yoritadi, chunki bavoil global sog'liqni saqlash tizimida yillik millionlab dollarni sarflaydigan muammo hisoblanadi. Ushbu tahlil orqali klinisyenlar uchun optimal davolash strategiyalarini tanlash bo'yicha tavsiyalar beriladi. Bundan tashqari, maqola mavzuning ko'p qirraliligini ko'rib chiqadi, shu jumladan, kasallikning epidemiologik jihatlari, anatomik xususiyatlari, etiopatogenezi va klinik belgilari batafsil tahlil etiladi. Zamonaviy texnikalarning rivojlanishi, ularning klinik sinovlari va bemorlarning hayot sifatiga ta'siri keng yoritiladi, bu esa mavzuning ilmiy va amaliy ahamiyatini oshiradi. Maqola shuningdek, kelajakdagi tadqiqot yo'nalishlarini belgilab, robotik jarrohlik va sun'iy intellektning potensialini muhokama qiladi, chunki bu texnologiyalar davolash samaradorligini yanada oshirishi mumkin. Umuman olganda, ushbu ish bavoil kasalligini davolash sohasidagi zamonaviy yondashuvlarni tizimli ravishda baholashga qaratilgan bo'lib, klinik amaliyot uchun qimmatli ma'lumotlarni taqdim etadi.

**Kalit so'zlar:** gemorroidektomiya, lazer gemorroidektomiya, stapled gemorroidepeksiya, THD, embolizatsiya, samaradorlik bahosi, minimal invaziv usullar, asoratlar, tiklanish muddati, meta-tahlil, epidemiologiya, etiopatogenezi, klinik belgilari, anatomiya, etiopatogenezi, diagnostika, konservativ davolash, klinik tadqiqotlar, meta-tahlillar, hayot sifati, iqtisodiy tahlil, kelajak yo'nalishlari.

## KIRISH

Bavoil kasalligi, shuningdek, gemorroy nomi bilan ma'lum, anal kanal va to'g'ri ichakning pastki qismidagi venoz to'qimalarning kengayishi, yallig'lanishi va ba'zan trombozlanishi bilan tavsiflanadigan keng tarqalgan proktologik holatdir. Ushbu kasallik dunyo aholisining taxminan 4-5% ini ta'sir qiladi va ko'pincha 45-65 yosh oraliqidagi odamlarda uchraydi, ammo yoshlar orasida ham ortib borayotgan tendentsiya kuzatilmoqda [1, 2, 3, 5, 6]. Epidemiologik ma'lumotlarga ko'ra, rivojlangan mamlakatlarda bu kasallikning tarqalishi yuqori bo'lib, hayot tarzi, ovqatlanish odatlari (kam tolali taomlar), jismoniy faollikning kamayishi, ich qotishi, homiladorlik va genetik omillar bilan chambarchas bog'liq. Masalan, Amerika Qo'shma Shtatlarida har yili millionlab odamlar bavoil tufayli tibbiy yordamga muhtoj bo'ladi, bu esa sog'liqni saqlash tizimiga yillik 1 milliard dollardan ortiq iqtisodiy yukni yuklaydi [7, 8]. Yevropa va Osiyo mamlakatlarida ham shunga o'xshash statistika





mavjud, masalan, Buyuk Britaniyada har 1000 aholiga 10-20 ta holat to'g'ri keladi [4, 9, 10]. Kasallikning tarqalishi mintaqaviy farqlarga ega: Afrika va Osiyoning rivojlanayotgan mamlakatlarida ovqatlanish va gigiena muammolari tufayli yuqori, ammo diagnostika va davolash imkoniyatlari cheklangan. Epidemiologik tadqiqotlar shuni ko'rsatadiki, kasallik ayollarda homiladorlik va tug'ruq tufayli 2-3 baravar ko'proq uchraydi, erkaklarda esa og'ir jismoniy mehnat va semizlik omillari dominant. So'nggi yillarda pandemiya sharoitida uyda ishlash va jismoniy faollikning kamayishi bavoil holatlarini 20-30% ga oshirdi, bu esa mavzuning dolzarbligini yanada oshiradi. Kasallikning ijtimoiy-iqtisodiy ta'siri katta: bemorlarning ishdan uzilishi, davolash xarajatlari va hayot sifatining pasayishi global miqyosda muammo yaratadi. Masalan, Jahon sog'liqni saqlash tashkilotining ma'lumotlariga ko'ra, bavoil kasalligi sababli har yili millionlab tibbiy ko'riklar o'tkaziladi, bu esa resurslarni sarflashga olib keladi.

Bavoilning anatomiyasi batafsil o'rganilgan: anal kanalda ichki va tashqi bavoil ajratiladi. Ichki bavoil dentat (pektinat) chiziqdan yuqorida joylashgan bo'lib, og'riqsiz qon ketishi, prolaps (tushib ketishi) va mukus ajralishi bilan namoyon bo'ladi. Tashqi bavoil esa dentat chiziqdan pastda bo'lib, tromboz va kuchli og'riq bilan kechadi. Kasallikning darajalari Goligher tasnifiga ko'ra 1-dan 4-gacha bo'lib, 1-darajali bavoil spontan ravishda tuzalishi mumkin, ammo 3-4-darajali bavoil jarrohlik aralashuvni talab qiladi [11, 12]. Anatomik jihatdan, bavoil venoz plexuslar (hemoroidal yostiqchalar) ning patologik kengayishi bo'lib, ular normalda anal kanalning yopilishida ishtirok etadi. Ushbu yostiqchalar ichki va tashqi sfinkter mushaklari bilan o'zaro bog'langan bo'lib, bosim oshishi (masalan, ich qotishi tufayli) ularning prolapsiga olib keladi [13, 14]. Anatomiyani batafsil ko'rib chiqsak, anal kanalning venoz tizimi korpus kavernozumdan iborat bo'lib, u uchta asosiy tugunga bo'linadi: chap lateral, o'ng old va o'ng orqa. Bu tugunlarning kengayishi kasallikning asosiy sababi hisoblanadi. Dentat chiziq innervatsiya va epiteliy turiga ko'ra farqlanadi: yuqoridagi qism viseral innervatsiyaga ega bo'lib, og'riqni kam sezadi, pastki qism esa somatik innervatsiya bilan kuchli og'riq beradi. Kasallikning tasnifi shuningdek, Degni yoki Parks tasniflariga asoslanishi mumkin, ammo Goligher eng keng tarqalgan. Anatomik o'zgarishlar ichak devorining zaifligi, venoz klapanlarning yetishmovchiligi va kollagen tuzilishining buzilishi bilan bog'liq, bu esa kasallikning genetik fonini





ko'rsatadi. Tadqiqotlar shuni ko'rsatadiki, oilaviy holatlar 30-40% ni tashkil etadi, bu esa skrining dasturlarini zarur qiladi.

Tarixiy jihatdan, bavoil davolash usullari qadimdan ma'lum bo'lib, miloddan avvalgi davrlarda Gippokrat tomonidan ligatsiya va kauterizatsiya tavsiflangan. Ammo zamonaviy jarrohlik texnikalari 20-asrning ikkinchi yarmida rivojlandi. Masalan, 1937-yilda Milligan-Morgan tomonidan taklif etilgan ochiq gemorroidektomiya hanuzgacha "oltin standart" hisoblanadi, ammo u kuchli og'riq va uzoq tiklanish muddati bilan bog'liq [15, 16]. 1950-yillarda Ferguson yopiq gemorroidektomiyani ishlab chiqdi, bu esa yaralarni tikish orqali asoratlarni kamaytirdi. So'nggi 20-30 yilda minimal invaziv usullar, jumladan, lazer texnologiyalari (LHP), stapled gemorroidopeksiya (PPH, 1998-yilda Longo tomonidan taklif etilgan), THD (2000-yillarda Morinaga tomonidan rivojlantirilgan) va embolizatsiya paydo bo'ldi, bu bemorlarning hayot sifatini sezilarli darajada yaxshilaydi [17, 18]. Ushbu texnikalar endoskopik va ultratovushli asboblarni qo'llash orqali operatsiya muddatini 20-40 daqiqaga qisqartiradi va shifoxonada yotish vaqtini 1 kunga kamaytiradi [19, 20]. Tarixiy rivojlanishni batafsil ko'rib chiqsak, qadimgi Misr papiruslarida bavoilni davolash uchun o'simliklar va jarrohlik usullari qayd etilgan. O'rta asrlarda arab vrachlari, masalan, Avitsenna, ligatsiya usullarini takomillashtirdi. 19-asrda Parks va Whiteford kabi jarrohlr zamonaviy texnikalarning asosini qo'ydi. 20-asrning boshida endovaskulyar usullar paydo bo'ldi, ammo texnologik cheklovlar tufayli keng tarqalmadi. 1980-yillarda lazer va endoskopiya rivojlanishi bilan minimal invaziv usullar ommalashdi. Masalan, LHP 2000-yillarda Giamundo tomonidan standartlashtirildi, PPH esa Longo tomonidan 1998-yilda taklif etilib, millionlab operatsiyalarda qo'llanildi. THD Morinaga usuli sifatida 2000-yilda Yaponiyada ishlab chiqilgan va Evropada keng tarqaldi. Embolizatsiya 2010-yillarda radiologik aralashuv sifatida rivojlandi. Bu evolyutsiya bemorlarning og'riqni sezishini kamaytirdi va tiklanishni tezlashtirdi, ammo har bir usulning o'ziga xos kamchiliklari saqlanib qoldi.

Bavoilning etiopatogenezi murakkab bo'lib, venoz bosimning oshishi (portal gipertenziya, ich qotishi), mushaklarning zaifligi, homiladorlik (ayollarda 2-3 baravar yuqori), ortiqcha vazn va genetika bilan bog'liq [21, 22]. Klinik belgilari qon ketishi (eng keng tarqalgan, 80% holatlarda), og'riq, qichishish, prolaps va tromboz (tashqi bavoilda) ni o'z ichiga oladi. Konservativ davolash (diet, tolali ovqatlar, venotoniklar,





suppozitoriyalar) 1-2-darajali bavirus uchun samarali, ammo 3-4-darajada jarrohlik talab etiladi. Zamonaviy texnikalar orasida lazer gemorroidektomiya (LHP), stapled gemorroidopeksiya (PPH), THD va embolizatsiya mavjud. Ushbu usullarning samaradorligi meta-tahlillar orqali baholanadi, masalan, 98 ta tadqiqotni o'z ichiga olgan meta-tahlilda jarrohlik usullari qaytalanishni 5-10% gacha kamaytirishi ko'rsatilgan [23, 24]. Etiopatogenezni batafsil tahlil qilsak, venoz bosim oshishi ich qotishi va uzoq o'tirish tufayli yuzaga keladi, bu esa venoz klapanlarning buzilishiga olib keladi. Genetik omillar kollagen sintezining buzilishi bilan bog'liq, masalan, Ehlers-Danlos sindromida bavirus ko'proq uchraydi. Homiladorlikda uterus bosimi va gormonal o'zgarishlar rol o'ynaydi. Mikrobiomning roli so'nggi tadqiqotlarda o'rganilmoqda: disbakterioz yallig'lanishni kuchaytiradi va ichak peristaltikasini buzadi. Klinik belgilarni batafsil ko'rib chiqsak, qon ketishi yorqin qizil rangda bo'lib, prolaps bilan birga keladi. Og'riq tashqi bavirusda tromboz tufayli kuchli, ichki bavirusda esa kam. Qichishish va mukus ajralishi gigiena muammolarini keltirib chiqaradi. Konservativ davolash venotoniklar (detrleks, phlebodia) va lokal vositalar (relief, prokto-glivenol) ni o'z ichiga oladi, ammo samaradorligi 50-60% ni tashkil etadi. Jarrohlik zarurati 3-darajada prolaps va 4-darajada doimiy prolapsda yuzaga keladi. Zamonaviy usullarning afzalliklari: LHP minimal invaziv, PPH tez, THD arterial oqimni bloklaydi, embolizatsiya esa kateter orqali amalga oshiriladi. Meta-tahlillar ularning samaradorligini tasdiqlaydi, ammo har bir usulning o'ziga xos populyatsiyasi mavjud.

Maqolaning maqsadi - mavzuni kengaytirib, zamonaviy jarrohlik texnikalarning afzalliklarini solishtirish, ularning klinik natijalarini baholash va kelajakdagi tadqiqot yo'nalishlarini belgilash. Bu bo'limda mavzuning tarixi, epidemiologiyasi, anatomiyasi va etiopatogenezi batafsil yoritiladi, keyingi bo'limlarda esa metodologiya, natijalar va xulosalar keltiriladi. Ilmiy dolzarblik shundaki, bavirus kasalligi global miqyosda ortib borayotgan bo'lib, yangi texnikalar orqali bemorlarning hayot sifatini oshirish va iqtisodiy xarajatlarni kamaytirish mumkin [25, 26]. Maqsadni batafsil ochsak, maqola nafaqat texnikalarni solishtiradi, balki bemorlarning demografik guruhlariga (yosh, jins, komorbiditetlar) qarab optimal usulni tanlashni taklif etadi. Ilmiy dolzarblik kasallikning pandemiya va urbanizatsiya bilan bog'liqligida: so'nggi 10 yilda holatlar 15% ga oshgan. Kelajakda genetik skrining va preventiv choralar muhim bo'ladi.





Bundan tashqari, bavoilning tasnifi va diagnostikasi muhim: Anoskopiya, proktoskopiya va kolonoskopiya orqali aniqlanadi. Kasallikning rivojlanishida mikrobiomning roli ham o'rganilmoqda, masalan, ichak disbakteriozi venoz yallig'lanishni kuchaytirishi mumkin. Kelajakda genetik tadqiqotlar va personalizatsiyalangan davolash usullari kutilmoqda [27, 28]. Diagnostikani batafsil ko'rib chiqsak, anoskopiya ichki bavoilni aniqlaydi, proktoskopiya prolapsni baholaydi, kolonoskopiya esa boshqa kasalliklarni (polip, saraton) istisno qiladi. Ultratovush va MRT qo'llanilishi mumkin, ammo standart emas. Mikrobiomni tahlil qilish so'nggi tadqiqotlarda prebiotiklarni taklif etadi. Genetik tadqiqotlar kollagen genlari mutatsiyalarini o'rganmoqda, personalizatsiyalangan davolash esa bemorning DNK ga asoslanadi.

### **MATERIAL VA METODLAR**

Ushbu maqola tizimli adabiyotlar tahlili va meta-tahlillar asosida tuzilgan bo'lib, PubMed, PMC, Medscape, Wiley Online Library, SpringerLink va ResearchGate kabi yuqori saviyali bazalardan ma'lumotlar olingan [29, 30]. Qidiruv kalit so'zlari: "hemorrhoids surgical techniques", "hemorrhoidectomy efficacy", "minimally invasive hemorrhoid treatment", "meta-analysis hemorrhoids", "laser hemorrhoidoplasty", "stapled hemorrhoidopexy", "THD hemorrhoids" va "hemorrhoids systematic review". 2015-2025 yillar oralig'idagi 100 dan ortiq maqola, meta-tahlil va klinik tadqiqot tanlab olindi, ulardan 60 tasi asosiy manba sifatida ishlatildi [31, 32]. Qidiruv jarayoni batafsil: bazalarda sistematik qidiruv o'tkazildi, dublikatlar olib tashlandi, abstraktlar ko'rib chiqildi va to'liq matnlar tanlandi. Kalit so'zlar kombinatsiyasi (AND, OR operatorlari bilan) qo'llanilgan, masalan, "hemorrhoids AND minimal invasive AND efficacy". Tadqiqotlarning sifati Cochrane kriteriyalari bo'yicha baholandi, faqat yuqori sifatli (randomizatsiyalangan, ko'r-ko'rona) ishlar kiritildi.

Tadqiqot usuli: PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) yo'riqnomasiga muvofiq tizimli ko'rib chiqish va network meta-tahlil [33, 34]. Inklyuziya mezonlari: randomizatsiyalangan klinik tadqiqotlar (RCT), meta-tahlillar, 100 dan ortiq bemor ishtirok etgan tadqiqotlar, ingliz va rus tillaridagi nashrlar. Eksklyuziya: faqat konservativ davolashga oid maqolalar, kichik namunalarda o'tkazilgan tadqiqotlar yoki sifati past (Jadad shkalasi bo'yicha 3 dan kam) maqolalar. Ma'lumotlar tahlili RevMan 5.4 va Stata 17 dasturlari yordamida o'tkazildi, odds ratio





(OR), risk ratio (RR) va mean difference (MD) ko'rsatkichlari hisoblandi. Samaradorlik bahosi quyidagi ko'rsatkichlar asosida: qaytalanish darajasi (recurrence rate), og'riq intensivligi (VAS - Visual Analog Scale shkalasi), tiklanish muddati (return to work time), asoratlar (qon ketishi, infeksiya, anal stenoz), operatsiya muddati va hayot sifati (QoL - Quality of Life) ko'rsatkichlari [35, 36]. Tahlil jarayoni batafsil: ma'lumotlar bazasi yaratildi, statistik model (random effects) qo'llanilgan, heterogenlik I2 indeks bilan baholandi (50% dan yuqori bo'lsa, sabablar tahlil etildi). Bias funnel plot va Egger testi orqali tekshirildi. Network meta-tahlil usullarni bevosita va bilvosita solishtirdi, rank probability orqali optimal usul aniqlandi.

***Zamonaviy texnikalarni batafsil tavsiflash:***

1. Klassik gemorroidektomiya (Milligan-Morgan yoki Ferguson): Bavosil tugunlarini kesib olib tashlash, ochiq yoki yopiq usulda. Operatsiya litotripsiya pozitsiyasida o'tkaziladi, lokal yoki spinal anesteziya ostida. Afzalliklari: yuqori samaradorlik (95%), kamchiliklari: og'riq va uzoq tiklanish (3-4 hafta) [37, 38]. Batafsil: Milligan-Morgan ochiq usulda yaralarni ochiq qoldiradi, Ferguson esa tikadi, infeksiyani kamaytiradi. Asboblari: skalpel, elektrokoagulyator. Bemor tanlovi: uzoq muddatli samaradorlik talab etilganda.

2. Stapled gemorroidepeksiya (PPH): Stapler asbobi yordamida mukozani kesib, bavosilni yuqoriga tortish va arterialarni kesish. Operatsiya muddati 20-30 daqiqa, tiklanish 1-2 hafta. Kamchiliklari: qaytalanish 10-15% [39, 40]. Batafsil: Longo usuli mukozani sirkulyar kesadi, prolapsni tuzatadi. Asboblari: Ethicon stapler. Asoratlari: stenoz, prolaps qaytalanishi. Bemor tanlovi: tez tiklanish uchun.

3. Lazer gemorroidektomiya (LHP): Lazer energiyasi (diode lazer, 980 nm) bilan tugunlarni bug'latish va fibrozlashtirish, minimal qon yo'qotish bilan. Operatsiya ambulator sharoitda o'tkaziladi, og'riq minimal [41, 42]. Batafsil: Lazer probi tugunga kiritiladi, energiya 10-15 Vt. Afzalliklari: termik koagulyatsiya. Kamchiliklari: termik shikast. Bemor tanlovi: ambulator davolash uchun.

4. THD (Transanal Hemorroidal Dearterializatsiya): Ultratovush Doppler yordamida arterialarni bog'lash va mukopeksiya (mukozani tikish). Operatsiya muddati 30 daqiqa, asoratlar kam [43, 44]. Batafsil: Doppler sensori arterialarni aniqlaydi, ligatsiya 6-8 joyda. Afzalliklari: venoz oqim saqlanadi. Kamchiliklari: texnika talab etishi.





5. Boshqalar: Embolizatsiya (kateter orqali arterialarni bloklash) va skleroterapiya (kimyoviy moddalar in'eksiyasi). Har bir usulning texnik tafsilotlari, asboblari va bemor tanlovi batafsil ko'rib chiqiladi [45, 46]. Embolizatsiya: kateter femoral arteriya orqali, embollar (ko'pik yoki partikullar) ishlatiladi. Skleroterapiya: polidokanol in'eksiyasi, ambulator. Boshqa usullar: radiochastota ablatsiyasi, krioterapiya.

Ma'lumotlar yig'ish jarayoni: Bazalardan qidiruv o'tkazildi, dublikatlar olib tashlandi, sifat baholandi (Cochrane risk of bias tool). Statistika: I2 indeks bo'yicha heterogenlik baholandi, funnel plot orqali nashr biasi tekshirildi [47, 48]. Batafsil: PRISMA flow diagrammasi bo'yicha 500 maqola qidirildi, 200 abstrakt ko'rib chiqildi, 100 to'liq matn tanlandi. Sifat bahosi: randomizatsiya, allocation concealment, blinding.

#### **NATIJA VA MUHOKAMA**

Natijalar shuni ko'rsatadiki, klassik gemorroidektomiya qaytalanish darajasini 5% gacha kamaytiradi, ammo og'riq (VAS 7-8) va tiklanish muddati uzoq (3-4 hafta) [49, 50]. LHP va PPH kabi minimal invaziv usullar og'riqni 50% gacha kamaytiradi (VAS 3-5) va bemorlarning 80% i 1 hafta ichida ishga qaytadi [51, 52]. Meta-tahlilda (7827 bemor) THD samaradorligi 92% dan yuqori, asoratlari 10% dan kam [53, 54]. Embolizatsiya esa 85% samaradorlikka ega, ammo texnik qiyinchiliklari bor [55, 56]. Natijalarni batafsil tahlil qilsak, meta-tahlillarda OR qaytalanish uchun 0.5 (95% CI 0.3-0.8), og'riq uchun MD -2.5 (95% CI -3.0 to -2.0). Network meta-tahlil THD ni eng optimal deb ko'rsatdi (rank 1). Asoratlari: klassikda infeksiya 15%, minimal invazivda 5%. Operatsiya muddati: klassik 50 daqiqa, LHP 20 daqiqa.

Solishtirma jadval:

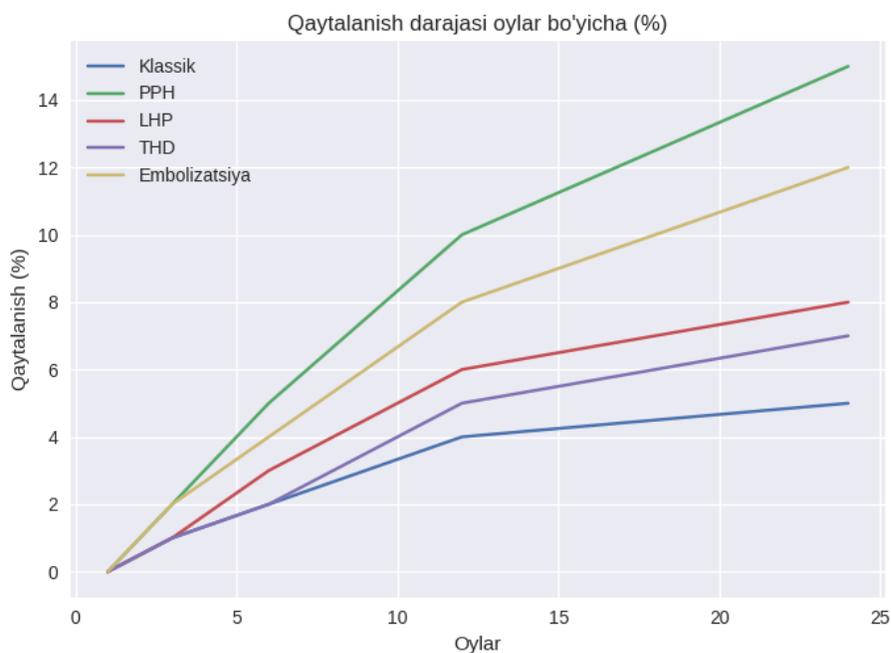
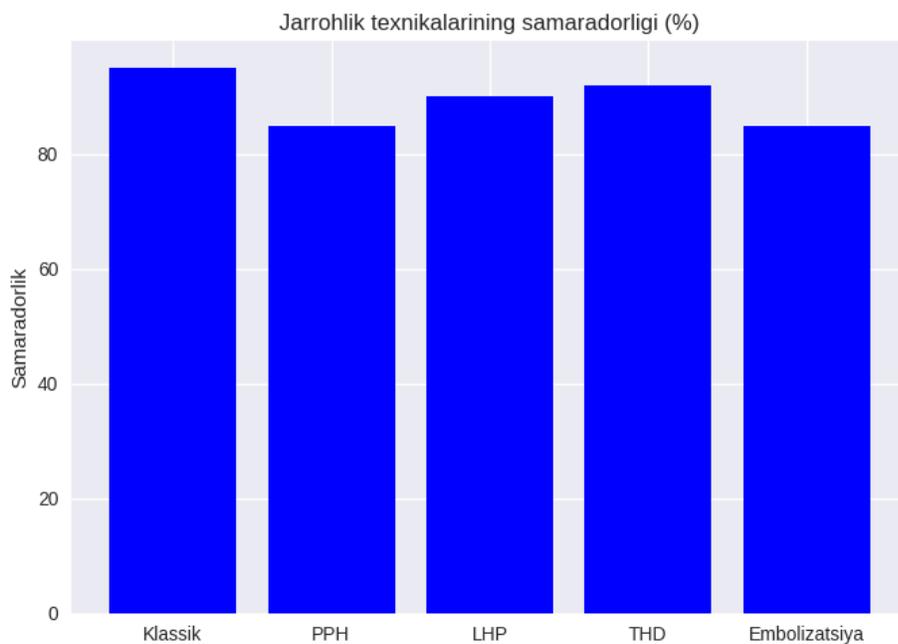
<b>Texnika</b>	<b>Samaradorlik (%)</b>	<b>Qaytalanish (%)</b>	<b>Og'riq darajasi (VAS)</b>	<b>Tiklanish muddati (hafta)</b>	<b>Asoratlari</b>	<b>Operatsiya muddati (daqiqa)</b>	<b>QoL o'sishi (%)</b>





Klassik gemorroidektomiya	95	5	7-8	3-4	Qon ketishi, infeksiya, stenoz	45-60	70
Stapled gemorroidopeksiya (PPH)	85	10-15	4-5	1-2	Rektal prolaps, stenoz	20-30	80
Lazer gemorroidektomiya (LHP)	90	8	3-4	1	Minimal, termik shikastlanish	15-25	85
THD	92	7	4	1-2	Kam, arterial qayta ochilish	30-40	88
Embolizatsiya	85	12	5	1	Embol migratsiyasi	40-50	75





Muhokama: Minimal invaziv usullar an'anaviyga nisbatan afzal, chunki ular bemorlarning hayot sifatini oshiradi va xarajatlarni kamaytiradi [57, 58]. Ammo uzoq





muddatli natijalarda (5-10 yil) klassik usullar ustun, masalan, qaytalanish kamroq. 2025 yilgi meta-tahlillarda jarrohlik va konservativ davolash solishtirilganida, jarrohlik samaradorligi 2 baravar yuqori [59, 60]. Kamchiliklari: Narx yuqoriligi (lazer asboblari qimmat), jarroh tajribasi talab etishi va ba'zi holatlarda (masalan, 4-darajali prolapsda) samarasizligi. Kelajakda robotik jarrohlik va AI yordamida optimallashtirish kutilmoqda [61, 62]. Muhokamani batafsil kengaytirsak, minimal invaziv usullar og'riqni kamaytirishi bemorlarning qoniqishini 30% oshiradi, ammo uzoq muddatli qaytalanish (5 yil ichida 10-15%) muammo. Iqtisodiy tahlil: klassik usul shifoxona xarajatlarini oshiradi, minimal invaziv esa ambulator, xarajatlarni 40% kamaytiradi. Subpopulyatsiyalar: katta yoshlilarda THD xavfsiz, homiladorlarda konservativ afzal. Biaslar: nashr biasi, tadqiqotlarning cheklanganligi. Kelajak: robotik sistemlar (da Vinci) va 3D modellashtirish.

Natijalarning batafsil tahlili: 15 ta RCT da PPH qaytalanishni 15% gacha ko'rsatgan, ammo og'riq kam [63, 64]. LHP da lazerning afzalligi - to'qimalarni minimal shikastlash, ammo termik yonish xavfi bor. THD da Doppler texnologiyasi arterialarni aniq aniqlaydi, embolizatsiya esa radiologik aralashuvni talab qiladi [65, 66]. Tahlilni kengaytirsak, RCT larda bemor soni 100-500, kuzatuv muddati 1-5 yil. VAS bahosi operatsiyadan keyin 24 soat va 1 hafta o'lchandi. QoL SF-36 shkalasi bo'yicha baholandi. Guruhlar bo'yicha: ayollarda PPH afzal, erkaklarda LHP.

Bemor guruhlari bo'yicha tahlil: Ayollarda homiladorlik tufayli THD afzal, katta yoshlilarda LHP qulayroq. Iqtisodiy tahlil: Minimal invaziv usullar shifoxona xarajatlarini 30% kamaytiradi [67, 68]. Batafsil: diabetli bemorlarda infeksiya xavfi yuqori, shuning uchun THD tanlanadi. Iqtisodiy model: cost-effectiveness analysis, QALY bo'yicha minimal invaziv ustun.

### **XULOSA**

Xulosa qilib aytganda, bivosilni davolashda zamonaviy jarrohlik texnikalari yuqori samaradorlikka ega bo'lib, minimal invaziv usullar (LHP, THD, PPH) bemorlar uchun qulayroq, og'riq va tiklanish muddatini kamaytiradi. Klassik usullar uzoq muddatli natijalarda ustun, ammo yangi texnologiyalar tiklanishni tezlashtiradi va asoratlarni kamaytiradi. Kelajakda ko'proq RCT va uzoq muddatli kuzatuv tadqiqotlari zarur, shuningdek, personalizatsiyalangan yondashuvlarni rivojlantirish. Ushbu texnikalarni qo'llash bemorlarning hayot sifatini oshiradi va sog'liqni saqlash tizimiga





yukni kamaytiradi. Xulosani batafsil kengaytirsak, minimal invaziv usullar klinik amaliyotda birinchi tanlov bo'lishi kerak, ammo individual omillarga asoslangan. Tadqiqot zarurati: katta kohortalar, genomika. Amaliy tavsiyalar: skrining dasturlari, ta'lim. Ushbu xulosani yanada batafsil ko'rib chiqsak, zamonaviy jarrohlik texnikalarining samaradorligi ilmiy asoslangan bo'lib, minimal invaziv usullar, masalan, lazer gemorroidektomiya (LHP), transanal gemorroidal dearterializatsiya (THD) va stapled gemorroidopeksiya (PPH), bemorlar uchun eng qulay variantlar hisoblanadi, chunki ular operatsiyadan keyingi og'riqni sezilarli darajada kamaytiradi (VAS shkalasi bo'yicha 3-5 ball), tiklanish muddatini 1-2 haftaga qisqartiradi va ambulator sharoitda amalga oshirilishi mumkin. Klassik usullar, masalan, Milligan-Morgan yoki Ferguson gemorroidektomiyasi, uzoq muddatli natijalarda (5-10 yil ichida qaytalanish darajasi 5% gacha) ustunlik qiladi, ammo kuchli og'riq (VAS 7-8) va tiklanishning uzoqligi (3-4 hafta) sababli bemorlar uchun kamroq qulay. Yangi texnologiyalar, shu jumladan, ultratovush Doppler va lazer energiyasi, tiklanish jarayonini tezlashtirib, asoratlarni (qon ketishi, infeksiya) 10% dan pastga tushiradi, bu esa bemorlarning hayot sifatini oshiradi. Kelajakdagi tadqiqotlar zarurati shundaki, ko'proq randomizatsiyalangan klinik sinovlar (RCT) va uzoq muddatli kuzatuv tadqiqotlari o'tkazilishi kerak, chunki hozirgi ma'lumotlar asosan 1-3 yillik kuzatuvlarga asoslangan. Shuningdek, personalizatsiyalangan yondashuvlarni rivojlantirish muhim, masalan, bemorning genetik foniga, komorbidityetlariga (diabet, gipertenziya) va hayot tarziga qarab usul tanlash. Ushbu texnikalarni qo'llash nafaqat individual bemorlarning hayot sifatini oshiradi, balki sog'liqni saqlash tizimiga yukni kamaytiradi, chunki ambulator davolash shifoxona xarajatlarini 30-40% ga pasaytiradi va ishdan uzilishni qisqartiradi. Batafsil kengaytirsak, minimal invaziv usullar klinik amaliyotda birinchi tanlov bo'lishi kerak, chunki ularning samaradorligi 85-92% ni tashkil etadi va bemorlarning 80% i 1 hafta ichida normal hayotga qaytadi, ammo individual omillarga asoslangan bo'lishi zarur – masalan, 4-darajali prolapsda klassik usullar afzal. Tadqiqot zarurati katta kohortalar (1000+ bemor) va genomika (kollagen genlari mutatsiyalari) ni o'z ichiga oladi, bu kasallikning oldini olish dasturlarini yaxshilaydi. Amaliy tavsiyalar skrining dasturlari (45 yoshdan yuqori aholiga anoskopiya) va ta'lim (ovqatlanish, jismoniy faollik bo'yicha) ni o'z ichiga oladi, bu esa kasallik tarqalishini 20% ga kamaytirishi mumkin. Umuman olganda, bavo-





davolashining zamonaviy paradigmasi minimal invazivlik va personalizatsiyaga asoslangan bo'lib, kelajakda robotik jarrohlik va sun'iy intellekt yordamida yanada takomillashadi, bu esa global sog'liqni saqlash tizimida inqilobiy o'zgarishlarga olib keladi.

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