

# Recommendations for eligibility criteria concerning bariatric and metabolic surgical and endoscopic procedures for obese Hong Kong adults 2024: Hong Kong Society for Metabolic and Bariatric Surgery Position Statement

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## ABSTRACT

The surgical management of obesity in Hong Kong has rapidly evolved over the past 20 years. Despite increasing public awareness and demand concerning bariatric and metabolic surgery, service models generally are not standardised across bariatric practitioners. Therefore, a working group was commissioned by the Hong Kong Society for Metabolic and Bariatric Surgery to review relevant literature and provide recommendations concerning eligibility criteria for bariatric and metabolic interventions within the local population in Hong Kong. The current position statement aims to provide updated guidance regarding the indications and contraindications for bariatric surgery, metabolic surgery, and bariatric endoscopic procedures.

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Obesity is a complex multifactorial disease caused by diverse combinations of genetic, behavioural, environmental, and endocrine aetiologies. In 2013, obesity was recognised by the American Medical Association as a disease state requiring treatment and prevention efforts.<sup>1</sup> Obesity substantially increases an individual's risks of cardiovascular diseases, metabolic illnesses, musculoskeletal problems, and cancer. For healthcare policymakers, the financial burden of treating and preventing obesity and its related conditions is exponentially growing. At the community level, reduced workforce productivity from obesity-related adverse health outcomes can lead to detrimental impacts on the broader economy.

According to the World Health Organization, adults are considered overweight when their body mass index (BMI) is  $\geq 25$  kg/m<sup>2</sup> and obese when their BMI is  $\geq 30$  kg/m<sup>2</sup>.<sup>2</sup> However, Asian populations have a higher percentage of body fat and greater metabolic risk at lower BMIs.<sup>3</sup> A World Health Organization expert consultation identified potential public health action points for Asians as 23.0 kg/m<sup>2</sup>, 27.5 kg/m<sup>2</sup>,

32.5 kg/m<sup>2</sup>, and 37.5 kg/m<sup>2</sup>; these values generally were 2.5 kg/m<sup>2</sup> lower than the thresholds established for Caucasians.<sup>4</sup> Because of differences in body frame and visceral fat distribution, lower BMI thresholds were used to define overweight ( $\geq 23$  kg/m<sup>2</sup>) and obesity ( $\geq 25$  kg/m<sup>2</sup>) in Asians.<sup>3</sup>

Similar to other regions of the world, obesity is a substantial public health problem in Hong Kong.<sup>5</sup> According to the latest Population Health Survey 2020/22 conducted by the Department of Health, the prevalences of obesity and overweight in people aged 15 to 84 years were 32.6% and 22.0%, respectively.<sup>6</sup> These prevalences indicate that at least half of the local Hong Kong population faces health risks associated with overweight or obesity.

## Bariatric and metabolic surgery

Bariatric surgery (ie, surgical treatment for obesity) has been continuously evolving worldwide over the past 50 years, with increasingly diverse procedural options and indications.<sup>7</sup> In 1991, the National

## 香港成年人接受減重及代謝外科手術及內窺鏡治療的建議準則：香港代謝及減重外科醫學會 2024年立場聲明

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香港肥胖症的外科治療在過去二十年間迅速發展。儘管大眾對減重和代謝手術的認識和需求不斷增加，但從事減重外科的醫護人員對手術應有的服務模式缺乏統一標準。因此，香港代謝及減重外科醫學會成立了工作小組，審查相關文獻，並就香港成年人進行減重及代謝外科手術及內窺鏡治療的資格標準提供建議。本立場聲明之目的為針對減重手術、代謝手術和減重內窺鏡治療的適應症和禁忌症提供最新指引。

Institutes of Health published the first international consensus endorsing the use of gastrointestinal surgery as treatment for severe obesity.<sup>8,9</sup> Since then, numerous studies have confirmed the effectiveness of bariatric surgery in achieving sustainable weight loss and substantial improvement in co-morbidities among obese patients.<sup>10</sup> According to a systematic review and meta-analysis of 22094 morbidly obese patients across 136 studies, bariatric surgery resulted in 61.2% excess weight loss.<sup>10</sup> Resolution of diabetes, hypertension, and obstructive sleep apnoea were achieved in 76.8%, 61.7%, and 85.7% of patients, respectively.<sup>10</sup> In a prospective randomised trial of 150 morbidly obese diabetic patients, bariatric surgery plus intensive medical therapy was associated with significantly better glycaemic and metabolic outcomes at 5 years compared with intensive medical therapy alone.<sup>11</sup> Because bariatric surgery has demonstrated efficacy in treating type 2 diabetes mellitus (T2DM), the term 'metabolic surgery' was established to describe the role of bariatric interventions in treating T2DM and metabolic syndrome.<sup>7,16</sup> In 2016, metabolic surgery was formally endorsed by 44 international diabetes organisations as a treatment option for adults with T2DM and obesity (defined as BMI >30 kg/m<sup>2</sup> for Caucasians and >27.5 kg/m<sup>2</sup> for Asians), particularly those with co-morbidities which cannot be controlled by lifestyle changes and pharmacological therapy.<sup>17</sup>

Although operative safety is a concern for morbidly obese individuals undergoing any type of major surgery, current evidence suggests that bariatric surgery has low perioperative mortality rates, ranging from 0.03% to 0.2%.<sup>12</sup> In a systematic review and meta-analysis of 161756 patients undergoing bariatric surgery, the 30-day mortality rates ranged from 0.08% to 0.22%, whereas the postoperative complication rates were between 9.8% and 17.0%.<sup>13</sup> Currently, the most widely performed

bariatric procedures are sleeve gastrectomy and Roux-en-Y gastric bypass. Common operative morbidities of sleeve gastrectomy include bleeding, leakage, stricture, and symptoms of gastroesophageal reflux.<sup>14</sup> Roux-en-Y gastric bypass is associated with bleeding, leakage, stricture, stomal ulcer, small bowel obstruction, internal herniation, and dumping syndrome.<sup>15</sup> Data from randomised controlled trials suggest that sleeve gastrectomy and Roux-en-Y gastric bypass are comparable in terms of 30-day mortality and morbidity rates.<sup>15</sup>

### Primary bariatric endoscopic intervention

In recent decades, bariatric endoscopic procedures have been developed for individuals who prefer less invasive, non-surgical alternatives.<sup>18</sup> These endoscopic therapies include intragastric space-occupying devices (intragastric balloons [IGBs]), gastric aspiration devices, endoluminal bypass barrier sleeves, the POSE (primary obesity surgery endoluminal) procedure, endoscopic sleeve gastropasty, and duodenal mucosal resurfacing. All of these procedures can produce clinically significant short-term weight loss and improvements in obesity-related co-morbidities.<sup>19</sup> The first bariatric endoscopic intervention in Hong Kong, IGB therapy, was introduced in 2004. An early local report confirmed its efficacy in weight reduction and co-morbidity improvement among obese patients at 6 months after treatment.<sup>20</sup> Compared with weight-reduction medication, IGB therapy was associated with better compliance and superior weight reduction for up to 2 years after treatment.<sup>21</sup> Because of its efficacy regarding short-term weight loss and co-morbidity improvement, IGB therapy can also serve as a bridging treatment prior to bariatric or other operative interventions; it facilitates preoperative weight loss that can reduce anaesthetic risks. Thus, IGB therapy is a justifiable non-surgical bariatric option for primary weight loss and preoperative weight loss.

### Overview of bariatric and metabolic surgery in Hong Kong

Hong Kong's first bariatric surgery programme was established in 2002 at Prince of Wales Hospital, affiliated with The Chinese University of Hong Kong.<sup>22</sup> Encouraged by the success and safety of the early Prince of Wales Hospital obesity surgery service,<sup>23</sup> increasing numbers of public and private hospitals have begun to provide bariatric surgical interventions to obese patients in Hong Kong (Table).

With the goal of promoting public and professional awareness about obesity treatment, leading local bariatric practitioners formed the

TABLE. Hong Kong Society for Metabolic and Bariatric Surgery survey of metabolic and bariatric procedures performed in Hong Kong during 2013 and 2020\*

	2013	2014	2015	2016	2017	2018	2019	2020
No. of hospitals	7	7	7	9	10	12	12	11
Total No. of procedures performed	97	172	213	243	213	224	235	184
Gastric banding	2 (2.0%)	4 (2.3%)	1 (0.5%)	3 (1.2%)	1 (0.5%)	0	0	0
Sleeve gastrectomy	84 (85.7%)	142 (82.6%)	165 (77.5%)	179 (73.7%)	159 (74.6%)	177 (79.0%)	164 (69.8%)	115 (62.5%)
Gastric bypass	6 (6.1%)	5 (2.9%)	11 (5.2%)	26 (10.7%)	13 (6.1%)	22 (9.8%)	32 (13.6%)	17 (9.2%)
Other surgeries								
Total	4 (4.1%)	3 (1.7%)	6 (2.8%)	13 (5.3%)	11 (5.2%)	4 (1.8%)	12 (5.1%)	28 (15.2%)
Gastric banding plication	3	3	4	5	1	0	0	0
One anastomosis gastric bypass	0	0	2	1	0	0	0	0
Sleeve gastrectomy plus duodenojejunal bypass	1	0	0	7	10	4	12	28
Biliopancreatic diversion with/without duodenal switch	0	0	0	0	0	0	0	0
Endoscopic								
Total	1 (1.0%)	18 (10.5%)	30 (14.1%)	22 (9.1%)	29 (13.6%)	21 (9.4%)	27 (11.5%)	24 (13.0%)
Intragastric balloon	1	16	27	20	22	21	25	24
Endoscopic plication	0	2	3	0	0	0	1	0
Endoscopic sleeve gastropasty	0	0	0	2	7	0	1	0
Procedures in public hospitals	50 (51.0%)	80 (46.5%)	100 (46.9%)	173 (71.2%)	159 (74.6%)	176 (78.6%)	174 (74.0%)	124 (67.4%)

\* Data are shown as No. or No. (%), unless otherwise specified

Metabolic and Bariatric Surgery Group under the Hong Kong Association for the Study of Obesity in 2012. In 2017, the Hong Kong Society for Metabolic and Bariatric Surgery (HKSMB) was established as an independent society. Surveys concerning bariatric surgery types and case volumes are carried out annually by the two bodies.

Metabolic and bariatric surgery options are broadly classified as restrictive procedures and malabsorptive procedures. In Hong Kong, common restrictive procedures are gastric banding and sleeve gastrectomy. The most common malabsorptive procedure is Roux-en-Y gastric bypass. Other less common malabsorptive procedures are one anastomosis gastric bypass, sleeve gastrectomy plus duodenojejunal bypass, and biliopancreatic diversion with or without duodenal switch. Between 2013 and 2020, 1582 bariatric surgical and endoscopic procedures were performed in Hong Kong (Table). Compared with 2002 when bariatric surgery was first introduced, the number of bariatric surgeries performed each year has exponentially increased from <10 cases per year to >180 cases per year in 2020. Current data indicate that more than two-thirds of these surgeries are performed in government hospitals. Sleeve gastrectomy is the

most common bariatric procedure in Hong Kong (~70%) and the second most common procedure is Roux-en-Y gastric bypass. Gastric banding, popular two decades ago, has not been favoured since 2013 (<2.5%). Biliopancreatic diversion with or without duodenal switch has not been performed in Hong Kong in the past ten years (Table).

### Development of the position statement

Although extensive international guidelines for bariatric surgery have been established by various bariatric authorities,<sup>24-27</sup> some of the existing recommendations are not applicable to the Hong Kong Chinese population because of ethnic and practical differences. Nevertheless, there is a lack of practical guidelines regarding bariatric endoscopic interventions for Asian populations.<sup>28</sup> Among local bariatric practitioners, there has been a lack of consensus regarding the indications, contraindications, and procedural options for bariatric surgery. This heterogeneity in clinical practices surrounding bariatric surgery in Hong Kong requires a position statement to address the concerns of local bariatric practitioners.

In 1991, the National Institutes of Health published a consensus statement regarding indications for bariatric surgery; it utilised BMI thresholds of  $\geq 40$  kg/m<sup>2</sup> or  $\geq 35$  kg/m<sup>2</sup> with co-morbidities for Caucasians.<sup>9</sup> The American Society for Metabolic and Bariatric Surgery and International Federation for the Surgery of Obesity and Metabolic Disorders recently updated the indications for metabolic and bariatric surgery.<sup>29</sup> Their joint statement suggested a new threshold of  $\geq 35$  kg/m<sup>2</sup> to receive a recommendation for metabolic or bariatric surgery, regardless of the presence, absence, or severity of co-morbidities. Additionally, metabolic and bariatric surgery should be considered for individuals with metabolic disease and BMI  $\geq 30$  kg/m<sup>2</sup>. For Asian populations, the joint statement suggested that BMI thresholds should be adjusted; specifically, individuals with BMI  $> 27.5$  kg/m<sup>2</sup> should be offered metabolic and bariatric surgery options.<sup>29</sup> In response to these revised BMI thresholds for metabolic and bariatric surgery, published in December 2022, extensive discussions and debates have arisen in various professional bodies focusing on metabolic and bariatric surgery in Asia, including groups in Hong Kong. Due to limited experience offering metabolic and bariatric surgery to patients with BMI  $< 30$  kg/m<sup>2</sup> in Hong Kong and other parts of Asia, long-term surgical risks and benefits for such patients have not been fully elucidated. Considering that metabolic and bariatric surgery options are associated with higher risks of perioperative morbidity in patients with lower BMI, the HKSMBS has reached a consensus to refrain from adopting the newly updated BMI threshold of  $\geq 27.5$  kg/m<sup>2</sup> to receive a recommendation for metabolic and bariatric surgery in this position statement.

The following position statement is issued by the HKSMBS to define the indications and contraindications for bariatric procedures and endoscopic interventions which are suitable for the Hong Kong population. The recommendations of this position statement are based on current clinical knowledge, expert opinion, and published peer-reviewed scientific evidence.<sup>25-28</sup>

## General recommendations

The HKSMBS recommends that bariatric and metabolic surgery be performed by surgeons with specialised experience and training in these procedures. Additionally, such procedures should be conducted at facilities with multidisciplinary teams of experts for appropriate perioperative assessment and follow-up care. The multidisciplinary team may include experienced surgeons, internal medicine physicians, weight management coordinators, nutritionists, exercise physiologists, and psychologists or mental health professionals.

## Eligibility for bariatric surgery

We define bariatric surgery as any surgical procedure primarily intended for weight reduction to improve physical and mental health in patients with severe obesity. After careful review of available data concerning the safety and efficacy of surgery for obesity and weight-related diseases, as well as the effectiveness of such surgery as treatment for obesity and related co-morbidities, the position statement committee reached a consensus on the recommendation of bariatric surgery for the following eligible candidates in the Hong Kong adult population (aged  $\geq 18$  years) who are unable to sustain weight loss through optimal lifestyle, dietary or non-surgical interventions:<sup>30</sup>

1. appropriate surgical candidates who have a BMI  $\geq 35$  kg/m<sup>2</sup> with or without obesity-related co-morbidities; and
2. appropriate surgical candidates who have a BMI  $\geq 30$  kg/m<sup>2</sup> with clinically significant obesity-related co-morbidities.

We define obesity-related co-morbidities as conditions either directly caused by obesity or known to contribute to the presence or severity of obesity. These comorbid conditions are expected to improve or resolve with effective and sustained weight loss. The list of comorbid conditions includes, but is not limited to, metabolic syndrome,<sup>31</sup> T2DM, non-alcoholic steatohepatitis, obstructive sleep apnoea syndrome, degenerative arthritis, and polycystic ovarian syndrome.

## Eligibility for metabolic surgery

We define metabolic surgery as any surgical procedure primarily intended to improve glycaemic control in obese patients with T2DM. For adults (aged  $\geq 18$  years) with T2DM who are unable to sustain weight loss through optimal lifestyle interventions, metabolic surgery is recommended for the following eligible candidates in treating T2DM with the primary aim of glycaemic improvement:<sup>17</sup>

1. appropriate surgical candidates with BMI  $\geq 37.5$  kg/m<sup>2</sup>, regardless of the level of glycaemic control or complexity of glucose-lowering regimens; and
2. appropriate surgical candidates with BMI ranging from 32.5 to 37.4 kg/m<sup>2</sup> whose hyperglycaemia is inadequately controlled by optimal medical, lifestyle, dietary, and non-surgical interventions.

In addition, metabolic surgery can be regarded as a treatment option for T2DM in appropriate surgical candidates with BMI ranging from 27.5 to 32.4 kg/m<sup>2</sup> whose hyperglycaemia is inadequately controlled despite optimal medical control by either oral or injectable medications (including insulin) and lifestyle interventions.

We consider hyperglycaemia to be inadequately controlled if the glycated haemoglobin level is

>7.0% despite medical treatment involving two or more oral hypoglycaemic agents or any injectable medications (including insulin or glucagon-like peptide-1 receptor agonist) for >6 months.<sup>32,33</sup> Fasting C-peptide levels should be checked if type 1 diabetes mellitus or latent autoimmune diabetes in adults is suspected.

## Eligibility for bariatric endoscopic interventions

### Intragastric balloon therapy

Intragastric balloon therapy is a minimally invasive space-occupying system intended to provide temporary weight loss by reducing gastric volume and altering gastric motility.<sup>34,35</sup> The following recommendations regarding IGB therapy are suggested:

1. As a bridging treatment for preoperative weight loss, IGB therapy can be considered:
  - a. prior to metabolic or bariatric surgery for the optimisation of medical and/or anaesthetic status in severely obese individuals with very high BMI (eg, >50 kg/m<sup>2</sup>) who fail to respond to non-surgical optimisation; and
  - b. prior to non-bariatric surgery (eg, joint replacement surgery, ventral hernia repair, etc) for the optimisation of medical and/or anaesthetic status in obese individuals with BMI >30 kg/m<sup>2</sup>.
2. As a primary interventional treatment, IGB therapy can be considered:
  - a. in individuals with BMI ranging from 27.5 to 32.5 kg/m<sup>2</sup> (30-35 kg/m<sup>2</sup> for Caucasians) who fail to achieve weight loss through optimal lifestyle and dietary interventions; and
  - b. in obese individuals who meet the eligibility criteria for bariatric or metabolic surgery but are surgically unfit or reluctant to undergo bariatric or metabolic surgery.
3. Intragastric balloon therapy should be used for a duration shorter than the maximum approved or recommended duration (usually 4 to 12 months, depending on IGB brand), or for a duration to be decided on a case-by-case basis. Patients should be informed about the intended duration of use.

### Other endoscopic procedures

Currently, many restrictive and malabsorptive endoscopic procedures are available. These include, but are not limited to, the following:

1. space-occupying restrictive gastric devices (eg, TransPyloric Shuttle, SatiSphere, Plenity, etc);
2. gastric diversion devices (eg, AspireAssist aspiration therapy);
3. endoscopic gastric plication techniques (eg, endoscopic sleeve gastropasty, the POSE procedure); and

4. malabsorptive techniques (eg, duodenojejunal bypass liner).

Some of these procedures have been approved by the United States Food and Drug Administration, whereas others remain investigational in most countries. Except for endoscopic gastric plication, AspireAssist aspiration therapy and endoscopic sleeve gastropasty, most of these endoscopic procedures have not been explored in Hong Kong. Due to the lack of scientific evidence and universal consensus regarding their indications, efficacy, and safety, these procedures should only be conducted after careful evaluation and the acquisition of informed patient consent and/or approval from institutional review board.

## Contraindications

Despite the beneficial effects of metabolic and bariatric surgery with clinically significant improvements in obesity-related co-morbidities, these procedures are not without surgical and anaesthetic risks. Moreover, most bariatric procedures involve a gastric restrictive component; an individual's ability to maintain postoperative dietary and lifestyle changes can substantially affect surgical outcomes. Therefore, the position statement committee reached a consensus on the following suggestions.

### Contraindications for bariatric and metabolic surgical and endoscopic interventions

Bariatric and metabolic surgical and endoscopic procedures should not be performed in the following situations or for the following individuals:

1. absence of multidisciplinary medical, dietary, and behavioural guidance;
2. no fully informed consent from the patient or his/her guardian regarding the risks, benefits, and real expectations for weight loss, co-morbidity management, and durability;
3. individuals with BMI <27.5 kg/m<sup>2</sup> (<30 kg/m<sup>2</sup> for Caucasians), unless the procedures are performed under a research protocol approved by a local institutional review board and/or research ethics committee and informed patient consent has been obtained;
4. individuals with medical conditions which cannot be optimised before surgery, leading to significantly increased anaesthetic and operative risks. These conditions include, but are not limited to, the following:
  - a. very high anaesthetic risk (defined as grade IV under the classification system of the American Society of Anesthesiologists) with organ failure that cannot be optimised and represents a constant threat to life;
  - b. uncontrolled endocrine disorders (eg,

- hypothyroidism, Cushing's syndrome, drug-induced obesity, etc);
- c. active infection (eg, tuberculosis, human immunodeficiency virus, etc);
  - d. uncorrected coagulopathy;
  - e. end-stage liver cirrhosis with or without portal venous hypertension;
  - f. uncontrolled enteropathy (eg, inflammatory bowel disease, protein-losing enteropathy, etc);
  - g. disseminated malignancy or advanced malignancy with <5 years of remission; and
  - h. uncontrolled major organ dysfunction (eg, cardiac, pulmonary, or renal disorders);
5. individuals with conditions that impair their understanding of surgery and preclude them from maintaining perioperative lifestyle changes. These conditions include, but are not limited to, the following:
- a. inadequately controlled psychiatric illnesses (eg, untreated schizophrenia, major depression, bipolar affective disorder, eating disorders, etc);
  - b. major depression with suicidal ideation and/or attempt within the past year;
  - c. personality disorder involving poor compliance with instructions; and
  - d. active substance abuse/alcoholism;
6. individuals with potential non-compliance problems regarding perioperative dietary and lifestyle changes. These conditions include, but are not limited to, the following:
- a. intellectual/mental disability;
  - b. syndromic/genetic disease leading to obesity;
  - c. condition causing immobility (eg, paraplegia, stroke, etc); and
  - d. inability to attend regular follow-up.

Moreover, bariatric and metabolic surgical and endoscopic procedures should not be offered to pregnant women.

### Contraindications specific to intragastric balloon therapy

Generally, individuals with the above contraindications for bariatric and metabolic surgical interventions are also not recommended to undergo IGB therapy. However, there are additional contraindications for IGB therapy. These contraindications include, but are not limited to, the following, where IGB therapy is not recommended for individuals:

1. with contraindications for endoscopies, allergies to proton-pump inhibitors, or allergies to balloon materials (eg, silicone, polyurethane, etc);
2. with active gastrointestinal pathology (eg, peptic ulcers, gastroesophageal varices, inflammatory bowel disease, etc), altered gastrointestinal anatomy (eg, previous gastrointestinal surgery, large hernia, suspect gastrointestinal malignancy,

etc), gastrointestinal motility disorders, or a history of idiopathic acute pancreatitis; and

3. actively using anticoagulants or antiplatelet medications, or individuals with a bleeding tendency.

For patients who are intended to undergo swallowable IGB therapy without prior endoscopy, a preoperative endoscopic examination should be considered if gastrointestinal pathology (eg, peptic ulcer, large hiatus hernia, etc) is suspected based on clinical assessment.

## Conclusion

This position statement is not intended to provide inflexible rules or requirements of practice, nor to establish a local standard of care. Clinical practitioners must use their own judgement in selecting the best evidence-based treatment for patients with informed consent. Physicians should follow a reasonable course of action based on current knowledge, available resources, and the needs of the patient to deliver effective and safe medical care. The sole purpose of this position statement is to assist practitioners in achieving this objective. This position statement was developed under the auspices of HKSMBS position statement committee and approved by the members of executive council. These recommendations were considered valid at the time of production based on the data available. New developments in medical research and practice will be reviewed, and the position statement will be periodically updated.

### Author contributions

Concept or design: All authors.

Acquisition of data: SKH Wong.

Analysis or interpretation of data: SYW Liu, SKH Wong.

Drafting of the manuscript: SYW Liu, CMS Lai, SKH Wong.

Critical revision of the manuscript for important intellectual content: SYW Liu, CMS Lai, SKH Wong.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

### Conflicts of interest

All authors have disclosed no conflicts of interest.

### Declaration

This position statement has been endorsed by the Hong Kong Association for the Study of Obesity. An abridged version of the position statement has been published on the website of the Hong Kong Society for Metabolic and Bariatric Surgery (<http://www.hksmbs.org/>).

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