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Reimbursement policies of Swiss health insurances for the surgical treatment of symptomatic breast hypertrophy: a retrospective cohort study

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Summary

BACKGROUND: Patients with symptomatic breast hypertrophy typically suffer from chronic back pain, recurrent skin irritation at the inframammary fold and/or low self-esteem resulting in impaired quality of life. Reduction mammaplasty has been shown to effectively treat symptomatic breast hypertrophy with high patient satisfaction. Despite the obvious benefits, reimbursement requests for reduction mammaplasty are initially often refused by the patient's health insurance company, thereby frequently resulting in additional examinations and eventually extra expenses. The study aim was to evaluate the reimbursement policy by health insurance companies for treatment costs of reduction mammaplasty in a patient cohort, to quantify the generation of additional costs due to initial refusal of reimbursement, as well as to assess back pain after surgical treatment.

METHODS: A retrospective cohort study was conducted in two Swiss centres. Inclusion criteria were a diagnosis of symptomatic breast hypertrophy, cost approval for reduction mammaplasty by the health insurance between October 2014 and March 2021 and informed consent for the study. The exclusion criteria were private payers for reduction mammaplasty and patients aged below 18. Primary outcome measures included median duration between the first request for reimbursement sent to the health insurance and the receipt of its approval, the number of requests needed per patient, as well as the number and type of additional outpatient visits conducted by specialists other than plastic surgeons, including the need for further diagnostic investigations and therapeutic measures. Secondary outcome measures included the additional costs generated in patients with more than one request. Finally, back pain after surgical treatment was assessed using a visual analogue scale (VAS).

RESULTS: A total of 46 patients with symptomatic breast hypertrophy and approval for reimbursement were included in the study. The median duration to obtain cost approval for reduction mammaplasty was 9.4 weeks (ranging from 1 to 154 weeks). Reimbursement was approved after 1, 2, 3 or 4 requests in 26, 6, 11 and 3 patients, respectively. If the first request was refused, further clinical evaluation by specialists, additional imaging of the cervical spine and physiotherapy was necessary in 70%, 35% and 80% of the patients, respectively. A patient requiring more than one request to obtain cost approval for reduction mammaplasty generated additional mean costs of approximately 2400 CHF, i.e. 2181 CHF, 164 CHF and 46 CHF for ongoing physiotherapy, additional outpatient visit by a specialist doctor and complementary imaging compared to patients needing only one request for cost approval. The level of back pain could be reduced from 7.0 before surgery to 1.6 after surgery.

CONCLUSION: Patients with symptomatic breast hypertrophy who needed more than one request for cost approval (43%) had to undergo further outpatient visits and/or radiological examinations, as well as physiotherapy, despite a clear indication for surgery, resulting in a prolonged symptomatology and increasing healthcare costs.

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Introduction

Symptoms caused by breast hypertrophy are manifold, yet although not very specific they are at least quite typical and consistent, including chronic back pain, recurrent tension headache and stiffness of the neck, shoulder grooving, numbness of the upper extremities, exercise intolerance, poor posture, including hyperkyphosis of the cervical spine and anteversion of the shoulders, as well as recurrent skin irritation ranging from cutaneous rash to superficial skin infections and possibly ulcerations, typically located in the inframammary fold (figure 1). Furthermore, symptomatic

breast hypertrophy often affects the patient's psyche, causing low self-esteem and resulting in limitations of daily life (e.g. difficulty in dressing appropriately, social isolation, tension in relationship) [1, 2].

Nevertheless, reduction mammaplasty is a commonly performed surgical procedure that may very effectively achieve relief of symptoms and therefore significantly improve the quality of life of affected patients [3–8].

Every citizen with residence in Switzerland is obliged to insure himself by adhering to one of the health insurance companies (HIC). Optionally, complementary insurance (*Zusatzversicherung / assurance complémentaire / assicurazione complementare*) may be taken out to cover medical treatments not covered by compulsory basic insurance. According to the Federal Law of Health Insurance (*Bundesgesetz über die Krankenversicherung* [KVG] / *Loi Fédérale sur l'Assurance-Maladie / Legge Federale sull'Assicurazione Malattie* [LAMal]), health insurance companies are obliged to reimburse all costs of any procedure required to diagnose or treat a disease or its sequelae. To be reimbursed, the diagnostic procedure or treatment has to cure or at least improve the medical state of the patient that has to be associated with a burden ("value of disease" = *Krankheitswert* / *valeur de maladie* / *valore di malattia*). The examinations and/or treatment options that are therefore needed can be defined by the physician who examines the patient and establishes the diagnosis [9].

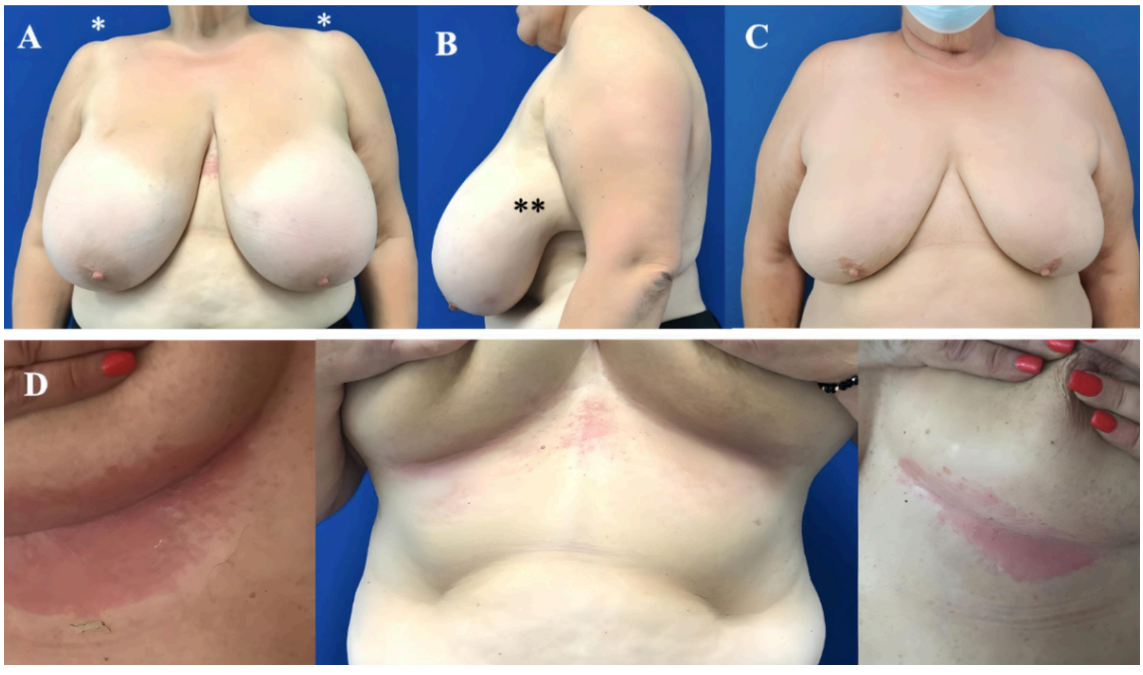
Social security law in Switzerland states that any kind of diagnostic procedure or medical treatment offered to a patient must be effective, appropriate and economical (so-called WZW criteria: *wirksam, zweckmässig, wirtschaftlich / efficace, adéquat, économique / efficace, adeguato, economico*). If these criteria are fulfilled, the compulsory basic insurance (*Grundversicherung / assurance de base / assicurazione di base*) is obliged to reimburse all costs related to the diagnostic procedure and/or medical treatment.

Typically, patients with symptomatic breast hypertrophy consult a board-certified plastic surgeon, who indicates reduction mammaplasty to causally treat symptomatic breast hypertrophy. These patients have often already undergone physiotherapy to strengthen the paravertebral musculature and improve posture, recurrent treatment of skin rashes or infections of the inframammary fold and/or some kind of imaging of the spine. Yet, reimbursement for reduction mammaplasty is initially often refused by the medical officer of the health insurance company. This results quite often in reconsideration of the case, including re-evaluation by the board-certified plastic surgeon, further investigation by other specialists (e.g. orthopaedic surgeon, neurosurgeon, dermatologist, rheumatologist, psychiatrist etc), continued physiotherapy, incapacity to work followed by absenteeism and – last but not least – loss of time for the patient. This process is not only frustrating for the patients, but could also be a source of increased costs for the patient in particular and the healthcare system in general.

In case of symptomatic breast hypertrophy, some more-or-less specific criteria shown in table 1 must be met for the health insurance company to recognise reduction mammaplasty as a compulsory treatment option. However, it does not seem to be mandatory that all defined criteria must be fulfilled [10]. In some cases, the patients' complementary insurances may cover the medical treatment that is not covered by the basic insurance, provided that this particular diagnostical or therapeutical procedure (includes also surgery) will be performed in a public hospital, as stipulated in the contracts between the caretaker and the basic health insurance companies.

Unfortunately, these rather well-defined criteria by the law may currently offer some "freedom for interpretation"

Figure 1: (**A**) Patient with hypertrophic, ptotic and heavy breasts with more than 1 kg excess breast tissue per side. Note the bilateral shoulder groove resulting from the bra straps (*). (**B**) Lateral adipoglandular tissue excess causing discomfort (**). (**C**) Hypertrophic breasts are often associated with ptosis and overweight of the patient. (**D**) Typical aspect of recurrent skin irritations at the inframammary fold.



when individual cases are evaluated by the medical officer of the health insurance company. This might be one of the reasons for "mutual misunderstanding" when a board-certified plastic surgeon who has not only collected a detailed patient history but also examined the patient submits an individual request for cost approval for reduction mammaplasty to the medical officer for review, who usually neither is a specialist in the field nor assesses the patient.

This study aims to analyse the current reimbursement policy by health insurance companies in Switzerland for the surgical treatment of reduction mammaplasty in a patient cohort treated in two Swiss centres, a Department of Plastic, Reconstructive and Aesthetic Surgery in a public hospital and the practice of a board-certified plastic surgeon operating in public and private hospitals.

Materials and methods

Study design and setting

A retrospective and descriptive cohort study was performed, including patients treated in the Department of Plastic, Reconstructive and Aesthetic Surgery at the Ente Ospedaliero Cantonale (EOC) in Lugano (Switzerland), as well as in a private practice in Lucerne (Wettstein Plastic Surgery). Both centres, one public and one private, are representative of the treatment of breast hypertrophy in Switzerland, in terms of both surgical experience of the board-certified surgeons working in these institutions and patient volume.

An application for approval to conduct the study was submitted to the regional ethics committee (*Comitato etico cantonale ticinese*) on 9 March 2021 (Req-2021-00309). The committee replied that ethical approval was not necessary because, due to its economic nature, the study does not fall within the scope of Article 3 of the Human Research Act. However, written informed consent for participation in the study was obtained from all patients included in the study, as required by the ethics committee. Separate informed consent for the surgery was obtained.

Participants

Inclusion criteria were a diagnosis of symptomatic breast hypertrophy, cost approval for reduction mammaplasty by the health insurance company and informed consent. The recruitment period ran from October 2014 to March 2021. The exclusion criteria were patients paying for reduction mammaplasty and patients aged under 18 years. The patients were referred by general practitioners or other specialists, or presented themselves on the advice of a third party to be seen in the outpatient clinics. If the clinical diagnosis of symptomatic breast hypertrophy was confirmed by the board-certified plastic surgeon, a letter was sent to the health insurance company requesting cost approval for reduction mammaplasty according to the current Swiss-DRG (Diagnosis-Related Group). After receiving confirmation for cost approval from the health insurance company, reduction mammaplasty surgery was performed by the board-certified plastic surgeons who had indicated surgery. Surgery was performed using the standardised technique according to Elisabeth Hall-Findlay [11, 12]. The follow-up visits were performed two weeks, six weeks, three months and one year after surgery and consisted of assessment of patient history, clinical examination, as well as quantification of current pain level. A specific questionnaire was delivered to the patients at the to assess surgery-induced changes in back pain using a visual analogue scale (VAS). Furthermore, global patient satisfaction concerning reduction mammaplasty was assessed. We were aware of the potential symptom recall bias before surgery.

Table 1:
Criteria to be met for health insurance companies to reimburse the costs of reduction mammaplasty in patients with symptomatic breast hypertrophy.

Large breasts cause regular physical or psychological discomfort resulting in a medical condition with a "burden"
Causal relationship between the discomfort and the large breasts
Procedure aims to eliminate the discomfort
Removal of at least 500 grams of skin and adipoglandular tissue per side
BMI must not exceed 25 kg/m²
Conservative measures (e.g. drugs, physiotherapy or muscle training) have remained ineffective

Primary and secondary outcome measures

Primary outcome measures were as follows: (a) the total time in weeks, i.e. the median duration between the first request for reimbursement sent by the board-certified plastic surgeon and the receipt of cost approval for reduction mammaplasty by the health insurance company; (b) the number of requests and reconsiderations needed until receipt of the written cost approval by the health insurance company; (c) the number of additional measures from the first request to cost approval and from the first refusal of cost approval to final approval for the following three categories of measures: outpatient visits by specialists other than plastic surgeons (i.e. orthopaedic surgeons, neurosurgeons, dermatologists, psychiatrists), imaging studies including X-ray, CT scan and MRI, and physiotherapy sessions.

Secondary outcome measures included the costs generated by the additional visits, diagnostic procedures and therapeutic measures performed during the evaluation period.

The costs were calculated using the following methodology. Costs at the EOC for a specialist visit, for a cervical spine X-ray, for a cervical spine CT scan and for a cervical spine MRI amounted, according to medical fare structure TARMED for outpatient treatment, to 240.30 CHF, 125.00 CHF, 342.20 CHF and 415.00 CHF, respectively. These additional costs were multiplied by the number of examinations performed for the subgroup of 26 patients requiring one request for cost approval and in the subgroup of 20 patients requiring multiple requests for cost approval. Costs for physiotherapy sessions were calculated by multiplying the cost of a single session of physiotherapy (69.30 CHF) by the mean number of sessions performed per week and the median duration in weeks in the two subgroups. Finally, the cost difference between these two subgroups was calculated, representing the additional ("extra") expenses in patients with more than one request for cost approval for reduction mammaplasty, due to the initial refusal of cost coverage by the health insurance company.

These additional costs per patient were eventually added and compared to the Swiss DRG for reduction mammaplasty (DRG-J24A; cost weight: 1.03; mean length

of hospital stay: 2.7 days). Thereby, following mean base rates were taken into consideration: 9730 CHF for cantonal hospitals (which corresponds to a mean base rate value of three cantonal hospitals in Switzerland in 2023) and 11,005 CHF for university hospitals (which corresponds to a mean base rate value of three university hospitals in Switzerland in 2023) for reduction mammaplasty.

Furthermore, the following baseline factors were evaluated: class of health insurance (3rd, 2nd and 1st class), age, BMI at surgery, sternal notch-to-nipple distance, grade of ptosis according to the classification of Regnault [13] and total weight of resected breast tissue.

Finally, all patients were asked whether their expectations had been met regarding their breasts after reduction mammaplasty. Pre- and postoperative back pain using the VAS were quantified. Moreover, BMI and weight of resected breast tissue are decisive factors for the health insurance company during the decision process regarding cost approval for reduction mammaplasty. The threshold values of the health insurance company are a BMI of 25 kg/m and an expected weight of breast tissue to be resected of 500 g or more. Thus, stratification by BMI and weight of resected breast tissue were performed in order to describe potential differences between patients in the two subgroups with a BMI of less or more than 25 kg/m and a weight of resected breast tissue of less or more than 500 g in terms of reduction of back pain.

Statistical methods

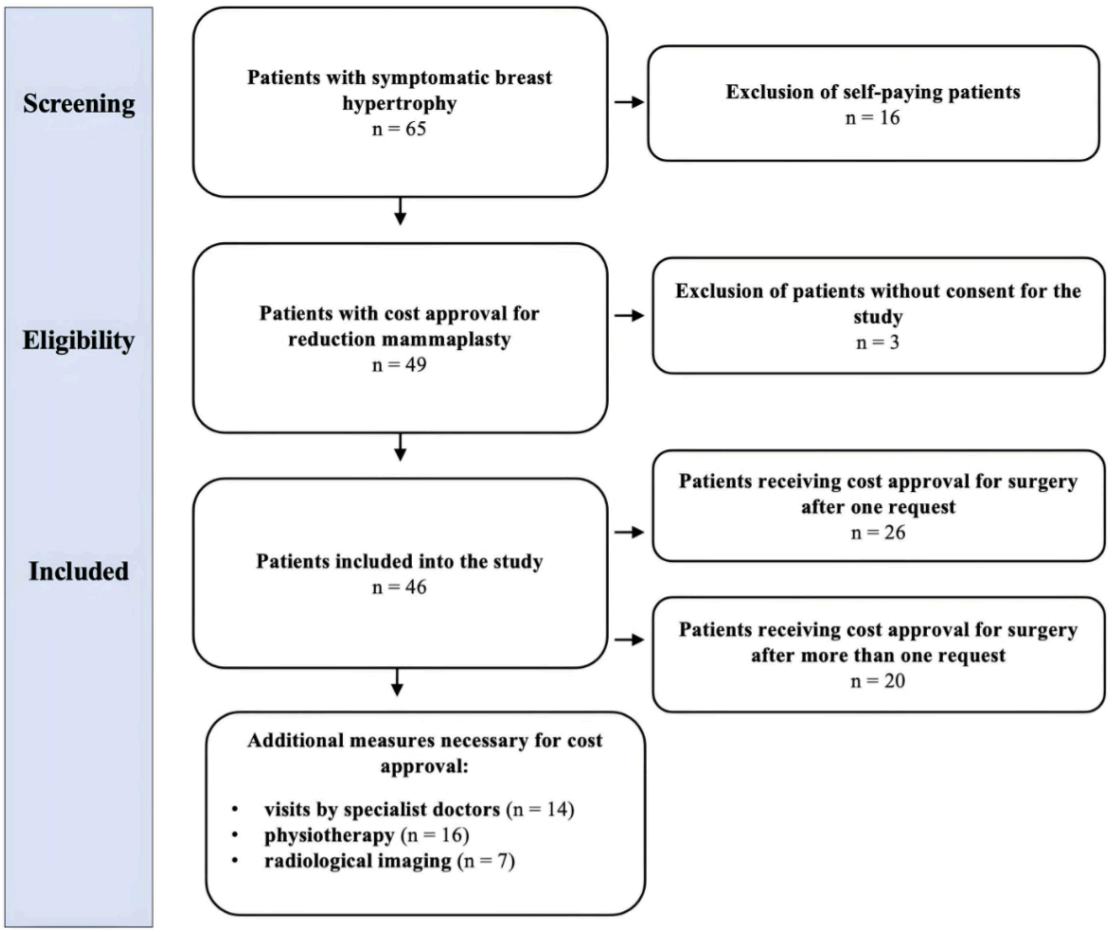
Categorical and numerical variables were expressed as counts or percentages. Statistical analysis was performed using DATAtab (Online Statistics Calculator; Dr. Mathias Jesussek, Seiersberg, Austria; URL https://datatab.net). For the evaluation of pre-operative and post-operative pain, a t-test for dependent samples was used. A p-value ≤0.05 was considered statistically significant.

Results

A total of 65 patients underwent reduction mammaplasty for symptomatic breast hypertrophy in the abovementioned period of time. Sixteen patients were excluded, since they did not receive cost approval for reduction mammaplasty by the health insurance company despite multiple requests; these patients eventually decided to pay the costs of surgery themselves. Furthermore, three patients did not consent to the study. Consequently, a total of 46 patients were included in the study (figure 2).

The mean age at surgery was 45 years (range: 16–76). The mean BMI was 26 kg/m^2 (range: 18–40), indicating only slight overweight. The mean sternal notch-to-nipple distance was 31 cm (range: 23–45) bilaterally, indicating an intermediate-to-high grade of breast ptosis of 3.3 (range: 1–4) according to the classification of Regnault. Finally, the mean weight of resected breast tissue amounted to 558

Figure 2: Study flowchart.



g (range: 105–1750) per breast. In four patients, the information regarding the weight of resected breast tissue was missing. The mean weight of resected breast tissue between right and left breast was calculated for each patient. In 22 patients (48%), the weight of resected breast tissue was less than 500 g with a mean weight of 308 g (range: 105–499) per breast (table 2).

The insurance status of the patients was as follows: the majority (35 patients or 76%) had only the compulsory 3rd class basic insurance. The remaining patients further had a private 1st or 2nd class health insurance. One patient with 1st class health insurance coverage (i.e. the most expensive health insurance) received cost approval with the following condition: surgical care could take place as long as the patient would be treated as a 3rd class patient despite paying an insurance fee for 1st class health care. Partial cost coverage by the complementary insurance instead of the basic insurance occurred in four cases (table 3).

The number of requests needed to obtain cost approval for reduction mammaplasty ranged from 1 to 4. In 26 patients (57%) only 1 request was necessary, whereas multiple requests were needed for the remaining 20 patients (43%), i.e. 2, 3 and 4 requests for 6, 11 and 3 patients, respectively (figure 3). The median duration from the first request to final approval was 9.4 weeks, with a range from 1 to 154 weeks, showing a clear correlation between the number of requests and time to obtain final cost approval (figure 4).

A more comprehensive analysis was conducted in the subgroup of patients (n = 20 or 43%) with refusal of cost coverage by the health insurance company following the first request despite unequivocal diagnosis and indication for surgery. The number of additional visits by specialists other than board-certified plastic surgeons concerned 14 patients (70%) with a total of 26 additional outpatient visits with orthopaedic surgeons, neurosurgeons, dermatologists and psychiatrists. Specifically, 5, 6 and 3 patients underwent 1, 2 and 3 additional visits, respectively. Of interest, in 7 of 20 patients (35%) the health insurance company requested specific imaging of the spine, including 7 conventional X-rays, 1 CT scan and 3 MRI scans. In addition, 16

Figure 3: Number of patients per subgroup needing 1 to 4 requests for cost approval.

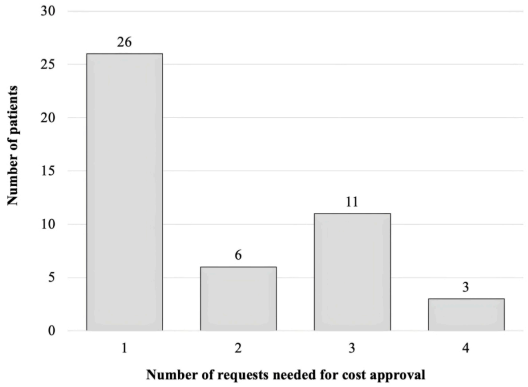


Figure 4: Median duration in weeks until cost approval according to the number of requests.

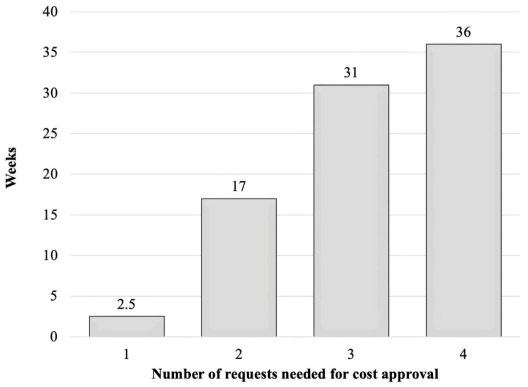


Table 2:
Baseline patient characteristics.

	Mean	Range
Patient age at surgery (years)	45	16–76
Body mass index at surgery (kg/m^2)	26	18–40
Sternal notch-to-nipple distance (cm)		
Right breast	31	23–43
Left breast	31	22–45
Grade of ptosis according to Regnault	3.3	1–4
Weight of resected breast tissue (g)	558	105–1750
Weight of resected breast tissue in patients undergoing reduction mammaplasty <500 g	308	105–499
Weight of resected breast tissue in patients undergoing reduction mammaplasty >500 g	833	501–1750

Table 3:
Health insurance company characteristics of patients.

Class of health insurance	**n**	**%**
Class I	6	13%
Class II	5	11%
Class III	35	76%
Class I–III	46	100%
Cost coverage		
100%	42	91%
80% (partial)	3	7%
50% (partial)	1	2%
50–100%	46	100%

of these 20 patients (80%) underwent physiotherapy before surgery ranging from one (6 patients) to three sessions (2 patients) per week. In the subgroup of 26 patients requiring only one request to obtain cost approval, fewer visits by a board-certified specialist and fewer sessions of physiotherapy were necessary, as shown in table 4.

Accordingly, undergoing additional visits by a specialist, pursuing physiotherapy, as well as performing complementary imaging generated extra costs. Table 5 demonstrates the cost analysis in both subgroups of 26 and 20 patients needing, respectively, one or more than one request for cost approval.

Finally, 42 patients (91%) stated that their expectations were met regarding the overall outcome of the reduction mammaplasty and eventually would undergo this type of surgery again. Objectively, surgery resulted in a significant reduction of high levels of chronic back pain of 7.0 (range 0–10) before surgery to very low levels of infrequent back pain of 1.6 (range 0–7) after surgery ($p = 0.006$; figure 5). Interestingly, patients with total resection of breast tissue less than 500 g per breast (22 patients or 48%) showed a significant reduction in back pain after surgery (mean [range] of VAS scores: 7.2 [0–10] preoperatively vs 2.0 [0–7] postoperatively) that was similar in the 20 patients (52%) with resection of more than 500 g breast tissue (7.0 [5–10] preoperatively vs 1.4 [0–7] postoperatively).

Moreover, the reduction in back pain on the VAS after reduction mammaplasty did not differ between patients with a BMI ≤25 kg/m² (22 patients or 48%) and those with a BMI >25 kg/m² (24 patients or 52%), as shown in table 6.

Discussion

Reduction mammaplasty is usually performed in healthy and middle-aged patients with symptomatic breast hypertrophy and is considered a safe procedure. Further, it is effective in decreasing symptoms and is associated with a high grade of patient satisfaction [4–7], also when performed in selected patient groups of younger age [14] and/or obese women [15].

To be representative, we were particularly interested in comparing our results with current evidence in the literature from healthcare systems that, like Switzerland's, use all-inclusive prices or flat rates per case (*Pauschale*/*forfait*) according to DRGs, for example those of Germany

Figure 5: Comparison of back pain before (pre-op) and after (post-op) reduction mammaplasty using a visual analogue scale (VAS) from 0 (no pain at all) to 10 (intolerable pain).

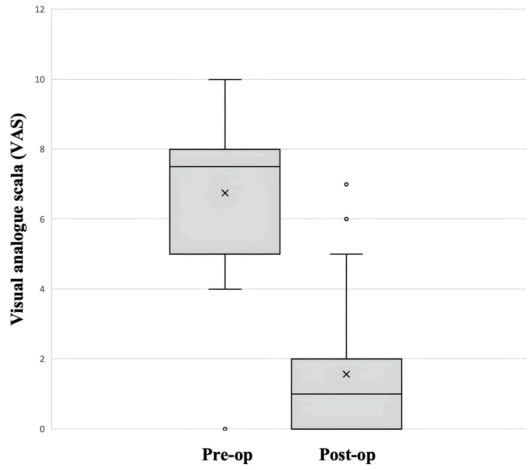


Table 4:
Number of patients who needed additional therapeutic and diagnostic measures.

	(n = 26)*	(n = 20)**
Physiotherapy	16 (62%)	16 (80%)
Visits by specialists (other than plastic surgeons)	12 (46%)	14 (70%)
Radiological imaging	9 (35%)	7 (35%)
Local skin therapy	12 (46%)	15 (75%)

* Subgroup of patients with one request for cost approval

** Subgroup of patients with multiple requests for cost approval

Table 5:
Mean costs in CHF of additional therapeutic and diagnostic measures.

	Total costs (n = 26)*	Costs per patient (n = 26)*	Total costs (n = 20)**	Costs per patient (n = 20)**	Difference in costs	Difference in costs per patient
Physiotherapy	4418	170	47,020	2351	42,602	2181
Visits by specialists	3845	148	6248	312	2403	164
Radiological imaging	2000	77	2462	123	462	46
Total costs	10,263	395	55,730	2786	45,467	2391

* Subgroup of patients with one request for cost approval

** Subgroup of patients with multiple requests for cost approval

Table 6:
Back pain before and after reduction mammaplasty, by body mass index at surgery.

Body mass index at surgery (kg/m)	≤25 (n = 22)	>25 (n = 24)
Pain before reduction mammaplasty, mean (range) VAS score	6.77 (4–10)	7.29 (0–10)
Pain after reduction mammaplasty, mean (range) VAS score	1.41 (0–5)	1.83 (0–7)

VAS: visual analogue scale.

and Australia. Scholz et al. evaluated the total costs that resulted from the assessment for symptomatic breast hypertrophy carried out by specialists from conservative treatment, including physiotherapy, massages, mud baths, as well as from anti-inflammatory and antalgic drug intake over a six-month period. The authors demonstrated that conservative treatment amounted to 4725 EUR compared to 3437 EUR for reduction mammaplasty. The authors further evaluated administrative costs resulting from application for reimbursement to the health insurance company as well as costs generated to contest the decision of the health insurance company in case of refusal. These costs included the applications for cost coverage, social medical reports by the medical officer of the health insurance company, reports from additional evaluations by specialists, lawyers' fees, court costs and reached an additional 3388 EUR per patient, almost amounting to the costs of reduction mammaplasty. The authors therefore demonstrated that surgical treatment – notably a causal treatment – was a safe and effective procedure, and is more cost-effective than symptomatic treatment with conservative measures over a longer period of time that would in most cases only act as a symptomatic therapeutic approach [16]. This fact has recently been confirmed by Crittenden et al., who conducted a cost-utility analysis in Australia. The authors could show a gain in quality-adjusted life-years in operated patients compared to non-operated patients [17]. Furthermore, it has been shown by Collins et al. that conservative treatment measures, including weight loss, regular skin care and physiotherapy, have significantly less impact on durable relief of symptoms and have to therefore be considered only symptomatic and temporary [18]. This is in line with the current study, showing that symptomatic patients who pursue conservative treatment and undergo further examinations for reevaluation by the medical examiner generate extra costs of almost 2392 CHF per patient without persistent symptom relief. These extra costs have to be compared with the mean total costs of reduction mammaplasty that usually amount to 9730 CHF in a cantonal hospital in Switzerland. These extra costs of 2391 CHF are as high as 25% of the total cost of the surgery and therefore particularly concerning in view of the fact that ultimately the patients included in this study underwent surgery anyway.

These results confirm that reduction mammaplasty is an effective treatment option for reduction mammaplasty with an overall high grade of satisfaction following reduction mammaplasty in more than 90% of patients and a reduction of mean pain levels by 77% decreasing from severe pain levels of 7.0 before surgery to levels of minor or almost no pain of 1.6 after surgery according to the VAS.

Treatment of symptomatic breast hypertrophy may be considered from an aesthetic or from a functional point of view, as health insurance companies try to clearly differentiate this aspect. Although surgical treatment of symptomatic breast hypertrophy aims to reduce or even eliminate symptoms, such as skin rashes, ulcerations, pain and/or tension, one cannot underestimate the pure aesthetic aspect of reduction mammaplasty, as many women's self-esteem is strongly related to their breast appearance and body image [19]. Despite the proven benefits of reduction mammaplasty in treating symptomatic breast hypertrophy, many patients do not have access to reduction mammaplasty, becauseit is still too often considered an "aesthetic procedure" by the health insurance company and therefore coverage of costs is refused. Basically, in Switzerland rather well-defined criteria determine whether reduction mammaplasty to treat symptomatic breast hypertrophy is reimbursed or not. If the patient meets the criteria – notably not all the defined criteria have to be met – surgery is deemed an obligatory service (*Pflichtleistung* / *service obligatoire* / *servizio obbligatorio*) [10] and reimbursed by compulsory basic insurance. Accordingly, the reimbursement should not be transferred to the complementary insurance, which is specifically meant to reimburse services like medical treatment related to alternative medicine, treatments at health resorts, dental treatments, preventive health measures or rescue costs, such as emergency rescue and repatriation in case of illness or accident abroad.

We however agree that it may often be difficult to make a clear-cut decision, since the surgeon in charge of the patient and the trusted physician of the health insurance company will again and again be confronted with borderline cases, where it will not be easy to differentiate between symptomatic breast hypertrophy and hypertrophic breast associated with ptosis that has increased with age and weight.

Rawes et al. emphasised the increasing difficulty of obtaining reimbursement for reduction mammaplasty in the United States in response to rising costs in their healthcare system. Health insurance companies therefore often include requirements for reimbursement of reduction mammaplasty that go further than those published by the American Society of Plastic Surgeons (ASPS) and are inconsistent with the current evidence. For example, the ASPS guidelines neither include age-based limitations nor a threshold for the amount of breast tissue to be resected. The authors however demonstrated that one in five health insurance companies would cover the costs only if patients were aged 18 years or over and a minimum of 500 g tissue per breast would be excised. In order to achieve some clarity and homogeneity in reimbursement policies for reduction mammaplasty, Rawes et al. summarised the criteria that must be met to obtain cost approval for reduction mammaplasty, such as the presence of symptomatic breast hypertrophy-related symptoms (chronic neck and back pain and/or shoulder grooving and pain, tension headache, skin irritations in the inframammary fold, etc.), documentation of failed conservative treatments (topical dermal treatment, analgesic measures, e.g. NSAIDs, massage, physiotherapy) and the performance of additional diagnostics (radiographs showing acquired kyphosis). In fact, the recommendations do not include either a minimum age or a minimal weight of breast tissue to be resected [20].

At this point it is important to underline that almost half (48%) of the patients included in the present study underwent reduction of breast tissue of approximately 300 g per side, i.e. significantly less than the 500 g per breast "required" for cost approval. This demonstrates that the threshold of 500 g tissue to be removed per breast is only a relative measure and the well-defined criteria by the law are only approximate. Though, we are convinced that it is important to provide an approximate expected resection weight per breast in the request for cost coverage, partic-

ularly if breast size does not "allow" resection of 500 g or more per breast. This is important, since a recent systematic review and meta-analysis by Wang et al. including 28 publications demonstrated that patient-reported satisfaction with their breasts after reduction mammaplasty did not correlate with the amount of breast tissue resected [21].

Nevertheless, these criteria, which ultimately determine whether symptomatic breast hypertrophy is considered a physical condition with a "burden", have to be used as a reference, rather than a binding decision criterion. The observation in our subgroup of patients is of particular importance, since there is clear evidence that patients with symptomatic breast hypertrophy undergoing smaller resections of less than 250 g of breast tissue still experienced significant improvement in several symptoms, including back pain, rashes at the inframammary fold, headache, exercise intolerance and lack of self-esteem as demonstrated by Strong et al. [22]. In addition, Spector et al. analysed symptoms before and after surgery and compared them between subgroups of patients undergoing resection of various weights of breast tissue (per 2 breasts), including less than 1000 g, 1000–1500 g, 1500–2000 g and >2000 g. No significant difference was found between the subgroups with regard to improvement of symptoms, including back pain, headache, skin changes, itching and difficulty in running, indicating that it is more important to "shape" a new and smaller breast that restores normal posture than to excise as much tissue as possible [23].

Furthermore, Hernanz et al. could demonstrate that obese women with a BMI higher than 30 kg/m also benefit from a persistently improved quality of life following reduction mammaplasty [15]. This indicates that surgery may also be the treatment of choice with persistent symptom relief in overweight patients, i.e. a patient group that does not meet the selection criteria used by health insurance companies in Switzerland. Since overweight patients are particularly often affected by refusal of cost approval, it has to be said that BMI does not always correlate with breast volume, which is confirmed by the fact that patients with low BMI and/or eating disorders may still have large and heavy breasts [24]. This fact can be underlined by the current study, since back pain improved significantly following reduction mammaplasty from very severe chronic pain levels to almost no pain in patients with a BMI below and above 25 kg/m^2. Overweight patients are often penalised by the fact that health insurance companies may require normalisation of weight as a prerequisite for paying the costs of reduction mammaplasty. They thereby refer to the so-called criteria to be met for health in order to reimburse the costs for reduction mammaplasty. However, Geiker et al. could demonstrate that symptoms related to breast hypertrophy persist even after weight loss, highlighting the continued need of performing reduction mammaplasty, in selected cases also in overweight patients [25].

At this point, it may be underlined that the decision to reimburse or not is based on a letter including all relevant patient information usually gathered by a plastic surgeon that is accompanied by a set of standardised photographs of the patient's current breast condition. It is an absolute rarity that the patient be seen and examined by the medical examiner of the health insurance company, also and particularly in cases with borderline values and/or after initial refusal that needs reevaluation. Finally, it is not only the decision of the health insurance company based on a suggestion of the medical examiner that is subjective, but also the plastic surgeon's evaluation, which is inherent to the nature of the symptoms of BH. Therefore, a fair evaluation for every single patient is probably an elusive goal.

The limitations of this study might be the small number of enrolled patients and the selection bias due to the 25% of patients with symptomatic breast hypertrophy classified as eligible for reduction mammaplasty by the board-certified plastic surgeon but who finally decided to undergo surgery at their own expense, rather than reconsider the case and/or wait. However, if we had included self-paying patients in this study, we expect the median duration until cost approval for patients with multiple requests would have been even higher. One potential bias affecting generalisability of the findings is that patients were only enrolled in two cantons. In theory, there should be no between-canton differences regarding cost approval for reduction mammaplasty. However, we cannot prove this.

Conclusion

In this study, 57% of patients with symptomatic breast hypertrophy received cost approval for reduction mammaplasty after a median of 2.5 weeks following the first request. However, despite a clear diagnosis and an indication for surgery, as evaluated by board-certified plastic surgeons, the reimbursement was initially refused in 43% of patients (median waiting time: 23 weeks), resulting in further outpatient visits by specialists, as well as additional complementary imaging and physiotherapy. This implied a 9.2-fold prolonged median duration and higher costs of 2391 CHF per patient compared to the patients who received cost approval for reduction mammaplasty after the first request to the health insurance company.

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References

1. Saariniemi KM, Keranen UH, Salminen-Peltola PK, Kuokkanen HO. Reduction mammaplasty is effective treatment according to two quality of life instruments. A prospective randomised clinical trial. J Plast Reconstr Aesthet Surg. 2008 Dec;61(12):1472–8. http://dx.doi.org/10.1016/j.bjps.2007.09.024.
2. Mundy LR, Homa K, Klassen AF, Pusic AL, Kerrigan CL. Understanding the Health Burden of Macromastia: Normative Data for the BREAST-Q Reduction Module. Plast Reconstr Surg. 2017 Apr;139(4):846e–53e. http://dx.doi.org/10.1097/PRS.0000000000003171.
3. Crittenden T, Watson DI, Ratcliffe J, Griffin PA, Dean NR; AFESA Research Group. Does breast reduction surgery improve health-related quality of life? A prospective cohort study in Australian women. BMJ Open. 2020 Feb;10(2):e031804. http://dx.doi.org/10.1136/bmjopen-2019-031804.
4. Colohan SM, Massenburg BB, Gougoutas AJ. Breast Reduction: Surgical Techniques with an Emphasis on Evidence-Based Practice and Outcomes. Plast Reconstr Surg. 2020 Sep;146(3):339e–50e. http://dx.doi.org/10.1097/PRS.0000000000007263.
5. Lin Y, Yang Y, Zhang X, Li W, Li H, Mu D. Postoperative Health-related Quality of Life in Reduction Mammaplasty: A Systematic Review

and Meta-Analysis. Ann Plast Surg. 2021 Jul;87(1):107–12. http://dx.doi.org/10.1097/SAP.0000000000002609.
6. Hermans BJ, Boeckx WD, De Lorenzi F, van der Hulst RR. Quality of life after breast reduction. Ann Plast Surg. 2005 Sep;55(3):227–31. http://dx.doi.org/10.1097/01.sap.0000171444.79737.70.
7. Pérez-Panzano E, Güemes-Sánchez A, Gascón-Catalán A. Quality of Life Following Symptomatic Macromastia Surgery: Short- and Long-term Evaluation. Breast J. 2016 Jul;22(4):397–406. http://dx.doi.org/10.1111/tbj.12589.
8. Crittenden T, Watson DI, Ratcliffe J, Griffin PA, Dean NR; AFESA Research Group. Does breast reduction surgery improve health-related quality of life? A prospective cohort study in Australian women. BMJ Open. 2020 Feb;10(2):e031804. http://dx.doi.org/10.1136/bmjopen-2019-031804.
9. www.fedlex.admin.ch. [Internet]. Federal Law on Health Insurance (LAMal), chapter 8 of federal low in Switzerland [cited 2022 Dec 12]. Available from: https://www.fedlex.admin.ch/
10. www.vertrauensaerzte.ch/manual/chapter38.html [Internet]. 5th edition of the Manual of the Schweizerische Gesellschaft der Vertrauens- und Versicherungsärzte (SGV), Chapter 38 [cited 2024 Oct 19]. Available from: www.vertrauensaerzte.ch/manual/chapter38.html
11. Hall-Findlay EJ. Pedicles in vertical breast reduction and mastopexy. Clin Plast Surg. 2002 Jul;29(3):379–91. http://dx.doi.org/10.1016/S0094-1298(02)00008-1.
12. Hall-Findlay EJ. Vertical breast reduction with a medially-based pedicle. Aesthet Surg J. 2002 Mar;22(2):185–94. http://dx.doi.org/10.1067/maj.2002.123052.
13. Regnault P. Breast ptosis. Definition and treatment. Clin Plast Surg. 1976 Apr;3(2):193–203. http://dx.doi.org/10.1016/S0094-1298(20)30220-0.
14. Nuzzi LC, Firriolo JM, Pike CM, Cerrato FE, Webb ML, Faulkner HR, et al. The Effect of Reduction Mammaplasty on Quality of Life in Adolescents With Macromastia. Pediatrics. 2017 Nov;140(5):e20171103. http://dx.doi.org/10.1542/peds.2017-1103.
15. Hernanz F, Fidalgo M, Muñoz P, Noriega MG, Gómez-Fleitas M. Impact of reduction mammoplasty on the quality of life of obese patients suffering from symptomatic macromastia: A descriptive cohort study. J Plast Reconstr Aesthet Surg. 2016 Aug;69(8):e168–73. http://dx.doi.org/10.1016/j.bjps.2016.05.012.
16. Scholz T, Diedrichson J, Olbrisch RR, Liebau J. [Cost analysis of conservative versus operative therapy of macromastia] [German.]. Handchir Mikrochir Plast Chir. 2008 Apr;40(2):100–4. http://dx.doi.org/10.1055/s-2008-1038475.
17. Crittenden TA, Ratcliffe J, Watson DI, Mpundu-Kaambwa C, Dean NR. Cost-utility analysis of breast reduction surgery for women with symptomatic breast hypertrophy. Med J Aust. 2022 Feb;216(3):147–52. http://dx.doi.org/10.5694/mja2.51343.
18. Collins ED, Kerrigan CL, Kim M, Lowery JC, Striplin DT, Cunningham B, et al. The effectiveness of surgical and nonsurgical interventions in relieving the symptoms of macromastia. Plast Reconstr Surg. 2002 Apr;109(5):1556–66. http://dx.doi.org/10.1097/00006534-200204150-00011.
19. Liao, Christopher D et al. “A Systematic Review of the Impact of Patient Factors on BREAST-Q Outcomes After Reduction Mammoplasty.” Annals of plastic surgery vol. 90,6S Suppl 5 (2023): S667-S673.
20. Rawes CM, Ngaage LM, Borrelli MR, Puthumana J, Slezak S, Rasko YM. Navigating the Insurance Landscape for Coverage of Reduction Mammaplasty. Plast Reconstr Surg. 2020 Nov;146(5):539e–47e. http://dx.doi.org/10.1097/PRS.0000000000007241.
21. Wang AT, Panayi AC, Fischer S, Diehm YF, Tapking C, Hundeshagen G, et al. Patient-Reported Outcomes After Reduction Mammoplasty Using BREAST-Q: A Systematic Review and Meta-Analysis. Aesthet Surg J. 2023 Mar;43(4):NP231–41. http://dx.doi.org/10.1093/asj/sjac293.
22. Strong B, Hall-Findlay EJ. How Does Volume of Resection Relate to Symptom Relief for Reduction Mammaplasty Patients? Ann Plast Surg. 2015 Oct;75(4):376–82. http://dx.doi.org/10.1097/SAP.0000000000000190.
23. Spector JA, Singh SP, Karp NS. Outcomes after breast reduction: does size really matter? Ann Plast Surg. 2008 May;60(5):505–9. http://dx.doi.org/10.1097/SAP.0b013e31816f76b5.
24. Losee JE, Jiang S, Long DE, Kreipe RE, Caldwell EH, Serletti JM. Macromastia as an etiologic factor in bulimia nervosa: 10-year follow up after treatment with reduction mammaplasty. Ann Plast Surg. 2004 May;52(5):452–7. http://dx.doi.org/10.1097/01.sap.0000123344.08286.3e.
25. Geiker NR, Horn J, Astrup A. Preoperative weight loss program targeting women with overweight and hypertrophy of the breast - a pilot study. Clin Obes. 2017 Apr;7(2):98–104. http://dx.doi.org/10.1111/cob.12175.