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Highlights

Children with Spinal Deformity

Relation to Acute Myocardial Infarction

Discovering Thoughts, Inventing Future

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Ozempic and its Protective Factors in Relation to Acute Myocardial Infarction

By Katryne Ferreira Rodrigues Correa, Laislenen Rachurat, Samara de Lima Silva, Maria Luísa Ginuino Carvalho, Ana Amélia Athaydes Clusella de Mello, Amanda Yanaze, Luciane Alves de Oliveira, João Vitor Rocha Alves, Eduardo Fernandes Rodrigues, Letícia Maria Dias Nobrega & Vanessa Siqueira Batista de Oliveira

Abstract- Introduction: The World Health Organization (WHO) estimates that cardiovascular diseases account for 31% of all deaths each year, making them the leading cause of death worldwide. As such, the search to reduce rates through the development of new treatments and approaches is incessant.

Methodology: This is a literature review whose bases were taken from the SciELO and PubMed data platforms. The search period was July 2023, meeting the inclusion criteria of articles from 2000 to 2023, in Portuguese and English, online and in full text.

Discussion: Cardiovascular diseases (CVD) are the leading cause of death worldwide and are among the main causes of disability and years of life lost, having an important social, economic, and quality of life impact on the population. (1,2) Cardiovascular risk factors include high cholesterol levels, diabetes mellitus, a sedentary lifestyle, high blood pressure, and obesity.

GJMR-F Classification: NLM: WG 100



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Ozempic and its Protective Factors in Relation to Acute Myocardial Infarction

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Letícia Maria Dias Nobrega [£] & Vanessa Siqueira Batista de Oliveira ^ς

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Final comments: In view of what has been covered in the text, it can be concluded that although the medication.

I. INTRODUCTION

The World Health Organization (WHO) estimates that cardiovascular diseases account for 31% of all deaths each year, making them the leading cause of death worldwide. As such, the search to reduce rates through the development of new treatments and approaches is incessant. The glucagon-like peptide-1 receptor agonist, or GLP-1RA, was launched in Brazil in 2018 and was developed for the treatment of diabetes mellitus. Its efficacy in reducing body fat, systolic blood pressure, total cholesterol, HDL-C, LDL-C, glucose tolerance, and body mass index was noted, thus reducing the risk of developing acute myocardial infarction. It is necessary to create a scientific basis for the correct use of the drug.

II. METHODOLOGY

This is a literature review whose bases were taken from the SciELO and PubMed data platforms. The search period was July 2023, meeting the inclusion criteria of articles from 2000 to 2023, in Portuguese and English, online and in full text. The following health descriptors (DeCS) were used as strategies to better evaluate the texts: "Ozempic", "acute myocardial infarction" and "protective factors".

III. DISCUSSION

Cardiovascular diseases (CVD) are the leading cause of death worldwide and are among the main causes of disability and years of life lost, having an important social, economic, and quality of life impact on the population. (1,2) Cardiovascular risk factors include high cholesterol levels, diabetes mellitus, a sedentary lifestyle, high blood pressure, and obesity.

Progress has been made in reducing the risk of CVD through drugs indicated to control high lipid levels, hyperglycemia, blood pressure, heart failure, inflammation, and/or thrombosis, and obesity, a crucial contributor to CVD, has been implicated in promoting all of these issues, suggesting that sustained and effective weight loss may have a cardiovascular benefit. (2,3, 4)

The glucagon-like peptide-1 receptor agonist, or GLP-1RA, was first created to help people with type 2 diabetes. It had clear effects on their blood sugar levels and weight loss, especially with long-acting GLP-1RA. But studies on heart disease safety in type 2 diabetes patients, most of whom already had heart disease and were overweight, showed that GLP-1 receptor agonists could lower the risk of heart disease. (9)

Since 2016, several cardiovascular (CV) outcome studies have shown that GLP-1 RAs can effectively stop CV events like acute myocardial infarction or stroke and the deaths that come with them. (6,7) In this sense, it is evident that semaglutide or Ozempic, GLP-1 receptor agonists (RAs), reduce weight, improve glycemia, decrease cardiovascular events in people with diabetes, and may have additional cardioprotective effects. (5, 5, 6, 8)

Thus, the GLP-1 AR semaglutide is in phase 3 studies as a drug for the treatment of obesity at a dose of 2.4 mg subcutaneously (s.c.) once a week, and its effects on heart disease and stroke in overweight or obese patients (SELECT) in a randomized, double-blind, parallel-group trial to see if semaglutide 2.4 mg subcutaneously once a week is superior to placebo when added to the standard of care for preventing serious adverse cardiovascular events in patients with established CVD and overweight or obesity, but without diabetes. SELECT is the first cardiovascular outcomes

trial to assess superiority in reducing major adverse cardiovascular events for an anti-obesity drug in such a population. (5, 6, 9)

In this way, this study could provide new approaches to reducing the risk of CVD by targeting obesity.

Furthermore, it is questionable whether Ozempic can be a protective factor for diseases other than cardiovascular disease, given that obesity is linked to conditions such as hypertension, sleep apnea, and non-alcoholic fatty liver disease.

Thus, it is likely that by reducing weight, these comorbid diseases will also improve patients' quality of life. (5;6;7;8)

IV. FINAL COMMENTS

In view of what has been covered in the text, it can be concluded that although the medication Ozempic was developed with the intention of helping to treat diabetes mellitus, it is functional for the treatment of other pathologies. It is true that, as it has the effect of controlling and reducing systolic blood pressure, total cholesterol, HDL-C, LDL-C, glucose tolerance, and body mass index, factors that make up the cardiovascular risk criteria, it is understood that it is directly related to reducing the likelihood of an acute myocardial infarction. It is worth noting that the association of medication with changes in patients' lifestyle habits, involving diet and physical activity, contributes to a higher prevention rate.

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Exploring School Ergonomics: Backpack use, Writing Posture and Musculoskeletal Health in Children with Spinal Deformity

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Abstract- Purpose: School ergonomics affects musculoskeletal system of children as many loads may lead to biomechanical impairments for a growing body. The purpose of this study was to determine the weight of school backpack, backpack positioning on back, handwriting position, and correlate them with number of other postural deformities of children who had spinal deformity.

Methods: This is a cross-sectional study which includes 108 children who had at least one spinal deformity. School backpack weight, backpack positioning, handwriting posture, and their correlations with postural deformities were analyzed. Body weight, backpack weight and backpack position were recorded. Writing position was assessed by Rapid Upper Limb Assessment (RULA). Posture analysis was conducted with observation to record other deformities except spinal deformities and total number of these deformities was recorded.

Keywords: primary school, backpack, handwriting, posture.

GJMR-F Classification: NLMC Code: WS 300



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Exploring School Ergonomics: Backpack use, Writing Posture and Musculoskeletal Health in Children with Spinal Deformity

Backpack and Handwriting among Children

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Abstract- Purpose: School ergonomics affects musculoskeletal system of children as many loads may lead to biomechanical impairments for a growing body. The purpose of this study was to determine the weight of school backpack, backpack positioning on back, handwriting position, and correlate them with number of other postural deformities of children who had spinal deformity.

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Results: It was found that most children with spinal deformity had inadequate backpack weight and incorrect writing posture. No relationship was shown among writing position ($r=0.140$), backpack position ($r=0.045$), and backpack weight/body weight ($r=0.046$) with other postural deformities. Although we cannot state that inappropriate writing or backpack use cause other deformities, we have seen that most children used inappropriate backpack weight and wrote in weak ergonomics.

Conclusion: Most children with spinal deformity used heavy backpacks with a low positioning on the back and their writing postures were not adequate so there is a need of change in these factors which are important determinants of schools ergonomics. Furthermore, children with spinal deformity tend to carry heavy backpacks and write inappropriately so future prospective papers may help to understand the “egg or chicken” relationship more clearly.

Keywords: primary school, backpack, handwriting, posture.

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I. INTRODUCTION

Children commonly start to face musculoskeletal problems at school ages, probably related to school based activities because children spend 30% of their time in school. One of the most common factors affecting the incidence of musculoskeletal discomfort is heavy school bags.¹ Children usually transport their books and school supplies by using backpacks as an external force to their bodies. These backpacks should be at safe load limit according to their body mass. In literature, range from 10% to 15% of children's body mass is acceptable for backpacks.^{2,3} Carrying a heavy backpack may result in postural misalignment with musculoskeletal deformities including scoliosis, excessive kyphosis, lordosis and head tilt.^{4,5} These issues are global concern and children are more affected than adults as their bodies still grow while being exposed with these external forces⁽⁵⁾. Additionally, the upper side of backpack should be at shoulder level so upper positioning on back with bilateral straps is recommended for a less risky backpack carriage instead of low positioning and using of backpack with unilateral strap.⁶

Moreover, handwriting is an important basic skill that children need to practice this skill for several hours to take notes or do homework. Sitting posture may worsen while handwriting because children try to do beautiful handwriting or they may feel tired in time and not protect correct posture. Sitting with inappropriate positions for long duration affects spine, shoulders, and pelvis.⁷ In literature, there is limited research about the effects of inadequate uses of backpacks and incorrect handwriting posture on musculoskeletal health or vice versa. Various musculoskeletal diseases such as disc hernias can develop or be triggered from early ages due to these ergonomic conditions of schools. Thus, if there is a relationship among them, it will be important to search further whether postural deformities cause inadequate ergonomic conditions or inadequate ergonomics results in more postural deformities.

The aim of this study was to determine the school backpack weight, positioning of backpack on spine, handwriting postures, and

postural deformities of schoolchildren who have at least one spinal deformity and then correlate these parameters.

II. MATERIALS AND METHODS

This study was a cross sectional study. All data was collected in the last month of the Fall semester of 2019-2020 academic year in order to standardize academic loading on children.

a) Participants

The children who continued to 4th grade in primary school and were 9 years old were included in the study because of their academic curriculums and their classroom locations. They have similar books etc. in their backpack and similar responsibilities at school. Moreover, in general, children had no problems about backpacks in the first years and they still try to find their best posture for handwriting in the first years of primary school, so the class was fixed rather than age. The schools in capital city of Nicosia were included in the study to exclude possible regional differences. The inclusion criteria were to be participated in a 4th grade, to have at least one spinal deformity which was determined with postural analysis (from anterior, posterior, and lateral), to have a backpack with straps, and to have a class in second floor since climbing up one floor with backpacks was fixed for the participants. All parents of these children were invited to the study.

The study was conducted in accordance with the recommendations of the Declaration of Helsinki. Before data collection, the children and their parents were informed about the purpose of the study and they signed informed consent forms. This ethical procedure was approved by the ministry of education in Northern Cyprus (İÖD.0.00-35/1B-988).

b) Procedure

Firstly, the parents or guardians were questioned whether they permit their children to be included in the study. Children of volunteer parents were included in the study. The assessments of every child took almost 30 minutes. All assessments were conducted by the first and second authors who were specialist physiotherapists. They shared the measurements so every measurement was conducted by the same researcher. The data was recorded by the third author to minimize bias.

c) Instruments

Socio-demographic information

Gender was recorded. After shoe removal, height and body weight were measured. Socioeconomic status of families was determined from the Socioeconomic Status Table which includes the occupation of parents.⁸

Backpack measurements

Full backpack weight was firstly measured. Secondly, position of backpack was recorded by measuring the distance between the upper border of the backpack and the C7 spinous process.⁹ Children were also asked to wear their backpacks as usual and the use of shoulder strap was recorded as bilateral/unilateral

Writing position

The children were asked to sit down on their school chairs and desks with their shoes on. They were then asked to write a specific sentence "I always go to school" on a blank A4 paper placed in front of them and their posture was observed according to the Rapid Upper Limb Assessment (RULA). The RULA which is a reliable test for assessing the children in 8-12 years has scores for every region of body.¹⁰ For example, how much neck/trunk flexion is done or whether the legs are supported. This was developed by Mc Atamney in 2005 to evaluate the ergonomics of people at their workplaces. The risk is calculated into a score of 1 (low) to 7 (high). RULA Scores 1 or 2 mean acceptable posture, 3 or 4 mean further investigation and change may be needed, scores 5 or 6 mean change soon is needed, and lastly score 7 means that implement change is needed.¹⁰

Musculoskeletal system problems

Posture analysis was conducted with observation from anterior, posterior, and lateral in barefoot condition. Total number of postural deformities including all postural deformities except spinal deformity such as pes planovalgus, genu valgum/varum, and anterior head tilt was recorded.

d) Data Analysis

The data were analyzed using the IBM Statistical Package for the Social Sciences (SPSS) 20.0. The qualitative findings were analyzed as frequencies and percentages (%). The quantitative findings were analyzed as means and standard deviations. Shapiro-Wilk test was used to analyze the distribution of the variables and the data was not normally distributed. The chi-square test was used to analyze the association between categorical variables. Difference on the $p < 0.05$ level was statistically significant.

Since the data was not normally distributed, Spearmann correlation test was used to analyze the relationships. The correlation coefficient was classified as $r = .00-.30$: negligible, $r = 0.30-0.50$: low, $r = 0.50-0.70$: moderate, $r = 0.70-0.90$: high and $r = 0.90-1.00$: very high correlation.

III. RESULTS

There were 968 children in the 4th year of the schools in Nicosia. 332 children had the criteria for inclusion in the study. 108 children (64 females, 44

males) were recruited with the consent of their caregivers. According to the socioeconomic level, 35.2% families were low, 41.7% families were middle, and 23.1% families were upper level.

When we analyze the results for the backpack, it shows that the mean backpack weight of the children was 5.83 ± 2.13 kg. In accordance with the body

weight, we found that, the mean percentage was 16.17 ± 6.68 (Table 1). When 15% was taken as a maximum limit, 62 children (57.4%) had heavy backpack. On the other hand, 10% was taken as a maximum limit, 88 children (81.5%) had heavy backpack.

Table 1: Descriptive results of the outcomes

	Mean \pm SD
Body mass index (kg/m ²)	18.85 \pm 3.92
Backpack weight (kg)	5.83 \pm 2.13
Backpack weight/body weight (%)	16.17 \pm 6.68
Backpack position (cm)	13.2 \pm 6.62
Writing position (RULA)	5.02 \pm 0.96

SD: Standart Deviation, RULA: Rapid Upper Limb Assessment

The mean distance between backpack to the neck region was 13.2 ± 6.62 cm. Additionally, it was observed that 92.6% of children used the bag straps bilaterally. According to the RULA, most of the children needed immediately change position (Table 2).

Table 2: The results of RULA

RULA	n(%)	
Score 1-2	6(5.6)	Risk negligible risk, no action required low risk.
Score 3-4	30(27.8)	Low risk, position change may be needed.
Score 5-6	72(66.6)	Medium risk, change may be needed, further investigation needed.
Score 6+	0	Very high risk, implement change now.

There was no relationship between the variables shown in the Table 3, except a low relationship between RULA and back extensor muscle strength.

Table 3: Correlations of backpack use and writing position with musculoskeletal factors

		Writing position (RULA)	Backpack position (cm)	Backpack weight/body weight (%)	Postural deformity	Extansor muscle strength
Writing position (RULA)	Speaman correlation	1	.045	-.046	.140	-.234*
	Sig. (2-tailed)		.646	.637	.150	.015
Backpack position (cm)	Speaman correlation	.045	1	-.093	-.066	.029
	Sig. (2-tailed)	.646		.337	.499	.763
Backpack weight/body weight (%)	Speaman correlation	-.046	-.093	1	.013	.037
	Sig. (2-tailed)	.637	.337		.890	.702
Postural deformity	Speaman correlation	.140	-.066	.013	1	-.161
	Sig. (2-tailed)	.150	.499	.890		.096
Extansor muscle strength	Speaman correlation	-.234*	.029	.037	-.161	1
	Sig. (2-tailed)	.015	.763	.702	.096	

IV. DISCUSSION

In this study, we analyzed the school ergonomics of children with spinal deformity according to backpack use and handwriting positions and we found that most children used heavy backpacks and had inadequate postures while writing. These ergonomic parameters were not found to be correlated with other postural deformities.

Backpack weight is still a huge problem, and a solution has not found yet.¹¹ It was determined that the average backpack weight was 5.8 ± 2.1 kg in our study. When we calculate the backpack percentage of body weight was $16.0 \pm 6.7\%$. This percentage is higher than acceptable range.^{2,3} There may be different causes of this percentage. Moreover, most children used heavy backpacks considering the upper limits as both 10% and 15%. One of the most probable reasons is that many schools did not have private traps to prevent carry everything between home and school in Northern Cyprus. There are various studies which show the effects of inadequate use of backpacks on posture of children while using it.^{5,12} Mo et al. showed that heavier backpacks caused an increase in forward head posture, rounded shoulder, and lateral tilt of shoulders while walking.¹² Vaghela et al. found a significant increase on sagittal shoulder posture of school children in standing with school backpack as compared to without backpack in standing⁽⁵⁾. Thus, it can be recommended that backpack-friendly school environments will be a good solution for excessive school backpack weights and their harms.

Additionally, Ramprasad et al.¹³ reported that backpack load of even 5% of body weight can significantly change trunk and lower limb angles and 15% of backpack load changes all the angles pertaining to head, neck, trunk, and lower limb and affects overall posture. Apostol et al.¹⁴ stated that lower placement of backpack on back causes more postural sways in the postures of children. While all these papers searched the changes in dynamic postures of children, our paper focused to investigate a correlation among backpack weight, backpack position over back and permanent musculoskeletal changes.¹⁴ This will be a pioneer for the readers to discuss the findings of this paper since children with a spinal deformity used inappropriate backpacks and inadequate handwriting posture so these ergonomics probably deteriorates existing deformity/deformities if no intervention is applied in this condition.

Looking at the correlation results, there was no correlation between backpack use and musculoskeletal systems of children with spinal deformity. Although many factors were standardized with the same class and location of class, there are still factors which may cause this result because the children were included from different schools. The other reason may be related

to the possible different use of backpacks according to the lectures in week. The other reason may be carrying duration of the backpacks as although we put a factor as second floor, in the capital city Nicosia, cars are commonly used for transportation and no children need to carry their backpacks for long times. We can conclude this result that inappropriate backpacks may not be a negative factor for musculoskeletal disorder even if child has a class in second floor. Nevertheless, further studies including children who carry their backpacks for longer durations are required.

In the past, handwriting posture was only investigated for the effects of dominant hemisphere of brain on various parameters.^{15,16} Nowadays, it is popularly stated that bad postures of handwriting negatively affect the quality of writing, but more importantly, these postures may harm children's spines.¹⁷ Moreover, today handwriting takes important roles to detect some mental diseases in earlier times and handwriting significantly contributes to improve fine motor skills of children so it should be searched more, especially for childhood.¹⁸ According to the observation by the RULA, the children in our study had trunk flexion, lateral flexion, and rotation in general and repetitive loading was added to every child as handwriting is long lasting activity in education. Considering the mean result and percentages of the RULA, we showed that most of the children needed a change soon.

To our knowledge, no study showed the correlation of handwriting positions with musculoskeletal problems, or no paper investigated the effects of bad handwriting position on musculoskeletal system of children. Thus, our paper has a pioneer role that investigated the correlation between handwriting posture and musculoskeletal problems. However, we did not find any significant correlation between handwriting posture and postural deformities. Thus, when we consider that most children with spinal deformity used heavy backpacks and used inappropriate handwriting posture, we can conclude that these factors probably caused this spinal deformity/deformities. Number of deformities may not be adequate to show a correlation so different methods like measuring angles of trunk can be used to investigate more details about postural misalignment. More research with prospective controlled study designs is required to investigate the effects of handwriting and observe the changes over time on children's health.

V. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

As a cross sectional study, sample size was not specified with a power analysis as we had limited number of children due to the population of Nicosia city so we included all adequate children of volunteer parents. The other limitation is the use of field tests as

outcome measures since the children were included in their natural environments, schools. More objective outcome measures could be used to assess postural deformities in laboratories. Lastly, schools were different so their ergonomic conditions and socioeconomic levels of the parents were also different and it can be stated that these factor may affect the results.

Although there was no correlation between ergonomic factors determined and postural deformities, school ergonomics was weak in most of the children included. Most of the primary school children with spinal deformity used heavy backpacks. Moreover, these children had bad postures while writing. Thus, ergonomic interventions are required for handwriting postures and backpack use of children. Moreover, teachers may be educated by ergonomic experts collaboration with physiotherapists and an ergonomic education lecture may be integrated into the curriculum of schoolchildren. In conclusion, more studies with larger samples and different study designs will be beneficial to guide health professionals and school managements in terms of school related loading to musculoskeletal system of children.

Key Messages

- Most of the children with spinal deformities use heavy backpacks and the positions of their backpacks are incorrect.
- The handwriting positions need change soon among children with spinal deformities.
- The number of other postural deformities rather than spinal deformities is not correlated with the factors of school ergonomics.
- Teachers, particularly primary school teachers, should be careful about the postures of children while teaching them writing and using the school staff.

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Declaration of Interest Statement

None

Availability of data

The data that support the findings of this study are available on request from the corresponding author, [.....]. The data are not publicly available due to the restrictions containing the privacy of participants.

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Severe Atopic Dermatitis and its Difficult Clinical Management

By Amanda Heloise Lacoski Santos, Sintia Gontijo de Oliveira, Mariana Amorim Barbosa, Amanda Pessoa Coimbra de Melo, Fernando Antonio Marçal, Ysla Vitória Damasceno Dias, Eduardo Fernandes Rodrigues, Vanessa Siqueira Batista de Oliveira, João Vitor Rocha Alves, Júlia Monte Teixeira Magnus, Maria de Fátima da Silva, Debora Alves Silva, Rayssa Blenda Martins, Letícia Maria Dias Nobrega, Pedro Henrique de Lima Nogueira, Philipe Bronzeado Cavalcanti Filho, Laura Resende Kanno & Rodrigo Daniel Zanoni

Abstract- Introduction: This paper will cover new updates on atopic dermatitis as a chronic and inflammatory condition that affects people of all ages but is most common in children. Its etiology involves genetic, immunological, and environmental factors, with risk factors such as maternal exposure during pregnancy, irritants, climate change, pollution, and more.

Methodology: The current study is a literature review, the database of which was taken from the SciELO (Scientific Electronic Library Online) and PubMed platforms.

Results: Atopic dermatitis is a chronic and relapsing disease that affects individuals of all ages, but especially children. It is an inflammatory condition that has a multifactorial etiology involving genetic, immunological, and environmental factors that damage the continuity of the epidermis. The incidence can vary according to geographical region as well as ethnicity. It is generally more common in developed countries, with around 15% to 20% of children and 1 to 3% of adults being affected, and its growth can be explained by urbanization and pollution added to the context, which are significant risk factors for this condition. [1]

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Severe Atopic Dermatitis and its Difficult Clinical Management

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Conclusion: In summary, atopic dermatitis is a complex, multifactorial condition that affects individuals of all ages. A clinical diagnosis is essential, and treatment varies according to severity. Recent advances, such as systemic therapies and immunobiologicals, offer new hope for patients with severe forms of the disease.

I. INTRODUCTION

This paper will cover new updates on atopic dermatitis as a chronic and inflammatory condition that affects people of all ages but is most common in children. Its etiology involves genetic, immunological, and environmental factors, with risk factors such as maternal exposure during pregnancy, irritants, climate change, pollution, and more. Genetics plays an important role, and recent studies have identified links with specific chromosomes. The diagnosis is clinical and based on symptoms such as itching and skin lesions characterized by areas of lichenification, papules, and nodules. Differential diagnosis includes other skin conditions and is often associated with other atopic diseases. The treatment of atopic dermatitis varies according to its severity. Moisturizers play a key role, and phototherapy, which uses UV radiation, is an effective option. Topical therapy with corticosteroids and

calcineurin inhibitors is necessary. In more severe and resistant cases, systemic therapies, such as immunosuppressants and immunobiologicals, can be considered. Advances in research and treatment have improved the quality of life of patients with atopic dermatitis, and the approach is multidisciplinary, involving different health professionals. It is essential to understand the treatment options available and adapt them to the needs of each patient.

II. METHODOLOGY

The current study is a literature review, the database of which was taken from the SciELO (Scientific Electronic Library Online) and PubMed platforms. The research was carried out in October 2023, meeting the inclusion criteria of articles from 2017 to 2023 in Portuguese and English, online texts and full texts, theses, master's dissertations, book chapters, monographs, and literature in magazines and scientific journals. Health descriptors (DeCS) were used to better evaluate the texts: "atopic dermatitis", "treatment," and "skin diseases".

III. RESULTS

Atopic dermatitis is a chronic and relapsing disease that affects individuals of all ages, but especially children. It is an inflammatory condition that has a multifactorial etiology involving genetic, immunological, and environmental factors that damage the continuity of the epidermis. The incidence can vary according to geographical region as well as ethnicity. It is generally more common in developed countries, with around 15% to 20% of children and 1 to 3% of adults being affected, and its growth can be explained by urbanization and pollution added to the context, which are significant risk factors for this condition. [1]

Among the risk factors, there are those related to the environment and those related to the individual. As environmental factors, it is possible to list maternal exposure during pregnancy: irritants and agents that cause itching, climate change, humidity, radiation, pollutants, exposure to smoke, very concentrated water, diet, among other factors. Genetics has been gaining

more and more strength in the cause of AD. Recent studies have found that atopic dermatitis is related to chromosome 3p and also to segments 3q14, 13q14, 15q14, and 17q21. In addition, other studies have described the immunological theory that it is explained by the Th2 response, which involves the activation of interleukins and their receptors as well as the activation of some skin barrier genes, such as the LAMA3, TEM 79, FLG2, and LELP1 genes. Atopic dermatitis develops due to a dysfunction in the barrier, an immune alteration that leads to an inflammatory response, or a combination of the two. [1] The diagnosis of atopic dermatitis can be made by the skin's immune system.

The diagnosis of atopic dermatitis is clinical, with pruritus being an obligatory symptom. In addition, the signs and symptoms must be associated with the patient's personal history. The skin lesions are usually characterized by areas of lichenification, papules, and nodules, as well as nummular eczema. Other manifestations include inflammation of the dry lips, infranasal erosion, intra-auricular tears, retroauricular intertrigo, eczema on the fingers, nipple, and pityriasis alba. The presence of erythema varies according to race, with blacks showing gray and Caucasians red. [1,2]

The differential diagnosis includes other skin diseases, such as infections (e.g., scabies), other forms of eczema (allergic contact dermatitis, irritant-toxic eczema, seborrheic eczema), and, in babies, seborrheic dermatitis. Patients often have associated diseases, including other atopic conditions (asthma, allergic rhinoconjunctivitis), rarely vernal keratoconjunctivitis, giant papillary conjunctivitis, superficial punctate keratitis, atopic keratoconjunctivitis, or otitis externa and media. Food allergies are demonstrable in 30% of children with severe atopic dermatitis, and immediate type 1 hypersensitivity to cow's milk, chicken eggs, peanuts, soy, and nuts is common. If atopic dermatitis is suspected, potential psychosomatic, allergic, or environmental triggers should be identified. The importance of these triggers varies greatly between individuals, and their prevention is a component of the personalized treatment plan. The role of dietary factors is often overestimated, particularly in childhood; instead, acute and chronic skin irritations and cold temperatures should always be considered as potential triggers of skin barrier dysfunction. Infections and vaccines can also aggravate atopic dermatitis, but children and adults with atopic dermatitis should be vaccinated. [2]

To help with diagnosis, allergy testing can be useful. The presence of sensitivity to a certain type of food does not imply the need for abstinence or treatment; only clinically relevant food allergies of the immediate type or very marked reactions of the late type are an indication for targeted elimination of the allergen. In cases of doubt, provocative tests should

be carried out under appropriate medical supervision. In cases of persistent atopic dermatitis and hypersensitivity to house dust mite allergens, hypoallergenic mattress covers and frequent washing of pillows and comforters are recommended. What to do in cases of sensitization to pet allergens must be decided individually. Patch testing with contact allergens is recommended for the additional demonstration of allergic contact dermatitis, which is difficult to distinguish from concomitant atopic dermatitis on clinical grounds alone. [3,4,5] In the case of allergic contact dermatitis, it is also possible to test for the presence of allergic contact dermatitis.

In addition to allergic tests, we can analyze eosinophilia. The presence of eosinophilia and elevated serum IgE levels is common in patients with atopic dermatitis (AD), but they are not specific to the condition. Eosinophilia is related to the severity of the disease and the deposition of extracellular proteins in the skin. Elevated serum IgE levels have limited diagnostic value, as high values can suggest allergic sensitization, but normal values do not rule out allergy. Patients with mutations in the filaggrin gene tend to have higher levels of serum IgE. However, IgE dosage is not useful as a biomarker for assessing AD exacerbations, and IgE depletion does not reduce AD symptoms. High levels of IgE in umbilical cord blood may indicate a risk of developing AD at 6 months of age [4].

Atopic dermatitis varies in its presentation, from mild to severe forms that require intensive treatment. To standardize treatment and follow-up, a score called SCORAD has been developed, which takes into account the extent of the disease, the severity of the lesions, and subjective symptoms such as itching. The resulting score classifies AD as mild, moderate, or severe. SCORAD can be calculated quickly and even has apps to make it easier to use. Another score, the EASI, excludes subjective symptoms, allowing for a more objective assessment of lesions in different areas of the body. Both the SCORAD and the EASI are considered the best instruments for assessing the clinical signs of AD, while other instruments have not been recommended due to inadequate measurement properties. [4,5] The EASI is also considered the best instrument for assessing the clinical signs of AD.

Severe atopic dermatitis is characterized by extensive, generalized, red rashes with some degree of inflammation that may have crusts, exudates, and areas of lichenification associated with intense pruritus that interfere with quality of life. In this type of AD, skin infections are more frequent. [4,6] The treatment of atopic dermatitis is not recommended.

Treatment for severe atopic dermatitis is complex, as it often does not respond to conventional therapy. Considering the chronicity of AD and the different levels of severity, the goals of AD treatment are to reduce the extent and severity of lesions; reduce

pruritus and improve sleep quality; maintain normal daily activities; improve quality of life; maximize disease-free periods; prevent infectious complications; and avoid or minimize adverse treatment events.

Improving the skin barrier in atopic dermatitis involves the regular use of moisturizers, which help restore moisture to the skin and reduce dryness, itching, and inflammation. Clinical studies have shown that the use of moisturizers improves the severity of the disease and reduces the need for topical anti-inflammatory medications. The recommended amount varies with age.

Moisturizers for atopic dermatitis contain emollients, occlusive substances, and humectants to maintain hydration, reduce water evaporation, and increase hydration of the stratum corneum. It's important to choose a moisturizer with few ingredients, without fragrances or sensitizers, to avoid allergic reactions. The choice of texture (lotion, cream, or baume) can vary according to preference and climate. It is recommended to apply the moisturizer two or three times a day, especially after bathing and on areas with or without lesions. Daily baths with warm water and physiological pH soaps or bath oils are recommended to avoid drying out the skin. New moisturizers contain ingredients such as cannabinoids, bioactive lipids, and modulators of the microbiome to provide additional benefits to the skin, such as regulating lipid production, reducing itching, and modulating the skin's microbiota. [2,5,6] Phototherapy is a modality used to treat skin lesions.

Phototherapy is a treatment modality for various inflammatory and immune-mediated diseases that uses ultraviolet (UV) wave spectra to irradiate the patient's skin. In atopic dermatitis (AD), two effective modalities are UVA-1 and narrowband UVB (UVB-FE), the latter being safer. Phototherapy acts by suppressing the skin's immune system, reducing the response of lymphocytes involved in AD, improving the skin barrier, and reducing *Staphylococcus aureus* infections. [3,5,6] It is recommended as an adjuvant treatment for atopic dermatitis.

It is recommended as an adjuvant treatment in cases where topical treatments fail before systemic immunosuppressive medications. Efficacy varies between patients, but RUVB-FE has shown benefits in improving eczema and reducing pruritus in clinical studies. The safety and efficacy of phototherapy with RUVB-FE have been proven in patients aged three and over, with remission rates of more than 50% in one year of treatment, especially in children with higher phototypes. However, equipment availability and costs can be limitations to accessing this treatment, and exposure to phototherapy can raise concerns about the risk of skin cancer, especially in pediatric patients. Although it is an effective option, phototherapy faces challenges related to cost, accessibility to equipment,

and possible exposure to skin cancer, especially in children, limiting its use in some regions. New technologies and more affordable devices could improve the availability of phototherapy in the future. [5]

Topical therapy is necessary for all patients, regardless of the severity of AD. This includes the use of topical corticosteroids and topical calcineurin inhibitors as a base treatment. New topical therapies, such as topical phosphodiesterase-4 inhibitors and topical Janus kinase inhibitors, are also emerging, although they are not yet available in Brazil [5, 6, 7].

Topical corticosteroids have a mechanism of action that includes anti-inflammatory, anti-proliferative, and immunosuppressive effects. They are the first treatment option for acute attacks of AD, as long as they are applied correctly, in the appropriate potency for each area, and in the necessary quantity. The potency of the corticosteroid should be adapted to the severity of the lesion and the region treated, avoiding potent corticosteroids in thin-skinned areas, such as the face, and giving preference to medium- and low-potency corticosteroids in children. [6,7] The use of corticosteroids in children is also recommended.

Various approaches can be used for systemic treatment. In cases of recurrent skin infections, especially with *S. aureus*, topical antibiotics can be used. Systemic antibiotics, such as first-generation cephalosporins, may be indicated for extensive surfaces. Immunosuppressants, such as systemic corticosteroids, cyclosporine A (CsA), methotrexate (MTX), azathioprine (AZA), and mycophenolate mofetil (MFM), are reserved for severe and refractory cases. The use of systemic corticosteroids should be extremely cautious due to their side effects. Cyclosporine A (CsA) is recommended as a first-line treatment for severe cases of AD in adults, children, and adolescents. Methotrexate (MTX) is an accessible and low-cost alternative, especially for severe cases. Azathioprine (AZA) is considered a second-line option when cyclosporine is not effective or is contraindicated. Mycophenolate mofetil (MFM) is a third-line therapy used in severe cases, although there is less evidence of efficacy on a large scale. [6] Immunobiology represents a class of drugs that are accessible and affordable, especially for severe cases.

Immunobiology represents a class of pharmacological agents used to treat inflammatory and allergic diseases. They are designed to target mediators of allergic inflammation, such as cytokines, and have played an important role in the treatment of immune-mediated diseases. Currently, these drugs are used to modulate the immune response, including blocking IgE and various cytokines, such as IL-4, IL-13, IL-22, IL-32, IL-17, and IL-23, which play a key role in the pathogenesis of diseases such as atopic dermatitis. Immunobiologicals are considered safe and can be prescribed on the basis of clinical assessment without

the need for extensive laboratory tests, making them a valuable option for patients with moderate to severe atopic dermatitis who do not respond adequately to other treatments. [7] The use of immunobiologicals in the treatment of atopic dermatitis is also important.

Learning about atopic dermatitis and how to treat it properly is important for making sure the patient has a good quality of life. In the worst cases, treating the condition can be more difficult and require the work of many professionals and areas of the patient's life. Studies on new technologies and approaches are increasingly being invested in research, and each year the treatment becomes more effective and evolves for individuals. [1,3]

IV. CONCLUSION

In summary, atopic dermatitis is a complex, multifactorial condition that affects individuals of all ages. A clinical diagnosis is essential, and treatment varies according to severity. Recent advances, such as systemic therapies and immunobiologicals, offer new hope for patients with severe forms of the disease. The multidisciplinary approach and constant research contribute to improving the quality of life of those affected, highlighting the importance of personalized treatment that adapts to individual needs.

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Relationship between Hope and Quality of Life in Patients with Advanced Cancer in Uruguay: An Observational Analysis

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Objective: To evaluate the correlation between hope and quality of life in Uruguayan patients with advanced cancer.

Materials and Methods: This observational, analytical-descriptive, and cross-sectional study used the Herth Hope Index (HHI) and the Functional Assessment of Cancer Therapy - General (FACT-G) Quality of Life questionnaire. It included 59 patients aged 18 or older, diagnosed with advanced, non-curable cancer.

Keywords: cancer; palliative care; hope, quality of life; FACT-G; herth index.

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Relationship between Hope and Quality of Life in Patients with Advanced Cancer in Uruguay: An Observational Analysis

Hope and Quality of Life in Advanced Cancer: A Uruguayan Study

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Abstract- Introduction: International research suggests a beneficial effect of hope on quality of life in advanced-stage cancer patients. Specific evidence for Latin America and Uruguay is limited, highlighting the need to explore this relationship for regional clinical strategies.

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Results: There was a positive but non-significant correlation between HHI and FACT-G scores (Pearson coefficient of 0.05). Hope significantly correlated with support from oncology services ($p=0.044$), family support ($p=0.003$), and spiritual beliefs ($p=0.029$). Factors like bone metastases, diagnostic delay, and being accompanied at consultations significantly impacted quality of life ($p=0.041$, $p=0.035$, $p=0.012$).

Conclusions: The study observed a positive association between hope and quality of life, but the lack of statistical significance indicates the need for more research. Clinically, results highlight the importance of comprehensive care addressing spiritual and emotional needs, in addition to medical treatment. It also underscores the potential impact of supportive services on patient well-being. Future research should include larger sample sizes and consider longitudinal designs to better understand hope's effects over time in advanced cancer patients.

Keywords: cancer; palliative care; hope, quality of life; FACT-G; herth index.

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I. INTRODUCTION

Cancer emerges as a predominant issue in global public health due to its high incidence and mortality. It is estimated that annually 14.1 million new cases are diagnosed worldwide, with 32.6 million individuals living with the disease and, unfortunately, 8.2 million lose their battle against it ⁽¹⁾. In Uruguay, the situation is not different: around 13,000 new diagnoses are recorded each year, excluding non-melanoma skin cancer. Of this number, more than 8,000 patients are in a phase where there are no curative treatment options available ⁽²⁾.

The experience of facing cancer is steeped in psychological and emotional nuances. An essential element in this journey is hope, an intrinsic human resource that facilitates adaptation to adversity ^(3,4). Moreover, quality of life reflects the individual's perception in the face of the challenge imposed by the disease. Despite the diversity in emotional responses to cancer, numerous patients cling to life, with hope as a fundamental pillar. Indeed, since the late 1980s, cancer has been in the focus of research exploring the power of hope in quality of life, noting its capacity to improve survival and the overall patient experience during the course of the disease ^(6,7).

Despite advancements, more research is needed to clarify and consolidate the relationship between hope and quality of life and to understand the factors that influence both dimensions. The importance of these studies is even more evident considering that, despite global research, there is a gap in Latin America and specifically in Uruguay.

Against this backdrop, our study aims to analyze the interaction between hope, quality of life, social and family support, and symptom control. The central hypothesis is that hope can significantly improve the quality of life of cancer patients in palliative care. Exploring this relationship and its associated factors could provide a basis for effective interventions that improve the lives of these patients.

a) *Main objective*

To understand the relationship between hope and quality of life in patients with advanced cancer.

b) *Secondary objectives*

To relate sociodemographic aspects to the perception of hope and quality of life in patients.

To determine the relationship between symptomatic control at the time of consultation (especially pain), hope, and quality of life.

To associate aspects of the quality of care with hope and quality of life.

II. MATERIAL AND METHODS

This was an observational, analytical-descriptive, and cross-sectional study that included patients over 18 years old with a recent diagnosis of disseminated cancer in palliative treatment, who were attended at the Oncology service of the Hospital de Clínicas between July 2021 and July 2022, and who provided their informed consent.

Data of interest about the patients were collected from the clinical history: primary site, sociodemographic factors, general aspects of the quality of care, presence of symptoms at the time of the consultation.

To measure hope in patients, the brief Herth Hope Index (HHI) questionnaire was used, which consists of 10 items with 4 response options. The participant was required to mark with an X the option that best suited them over the last two weeks. This scale takes into account daily aspects of the patient's life such as optimism about life, short and long-term plans, faith, possibilities within their state of health, among other items of interest. The higher the score obtained, the higher the level of hope, so it was evaluated as a continuous quantitative variable.

Additionally, the "Functional Assessment of Cancer Therapy – General" (FACT-G) questionnaire was administered. This scale has been used and validated in our country. It assesses the quality of life in cancer patients over the last seven days, analyzing four key aspects: physical, social, emotional, and functional well-being, through 27 items that are categorized using a Likert or ordinal scale ranging from 0 to 4 (0 = not at all, 1 = a little bit, 2 = somewhat, 3 = quite a bit, 4 = very much). It investigates different everyday aspects of the patient that include rest, joy, sadness, satisfaction, the degree of acceptance towards their illness as well as their concern about death, among others. Through this, a profile of the patient is obtained and a score on their perception of their overall quality of life and health in general. It should be noted that there are no proposed cut-off points, so the higher the score, the higher the quality of life, except for some items like the physical and emotional FACT-G where a higher score indicates a lower quality of life. In the same way as the HHI

questionnaire, it was also analyzed as a continuous quantitative variable, in which there are also no cut-off points, behaving similarly to the FACT.

The correlation between hope as measured by the HHI and quality of life as measured by the FACT-G was assessed using the Pearson test. Descriptive statistics techniques were used for the rest of the study variables: means along with their measures of dispersion for continuous variables, and percentages for categorical variables.

Means of the different groups were compared using ANOVA tests. A p-value of 0.05 with a one-tailed test was always considered to determine statistically significant differences. As for data analysis, SPSS-25 software was utilized.

III. PATIENT RESULTS DISSEMINATION PLAN

Acknowledging the importance of sharing the findings of our research with patients and their families, we have developed a specific plan to ensure that the results of the study "Relationship between Hope and Quality of Life in Patients with Advanced Cancer in Uruguay: An Observational Analysis" are accessible and meaningful to them. This plan includes the following actions:

1. Patient-Friendly Summary

We will create a summary of the study's findings, written in clear and accessible language, avoiding technical jargon. This summary will highlight the key findings and their relevance for patients with advanced cancer.

2. Distribution through Oncology Care Centers

We will collaborate with oncology care centers in Uruguay to distribute the summary to patients and their families. This will ensure that the information reaches directly those who can benefit most from it.

3. Virtual Information Sessions

We will organize virtual information sessions where researchers will present the results and answer questions. These sessions will be advertised in clinics and hospitals, and open to all interested patients and their families.

4. Online Informational Material

We will publish the summary and other related informational materials on a dedicated website, accessible to patients and the public. This will provide a permanent resource for study information.

5. Collaboration with Patient Organizations

We will work in conjunction with local cancer support organizations to disseminate the results. These organizations can help contextualize the findings within the experiences and needs of the patients.

6. Feedback and Evaluation

We will seek feedback from patients and their families on the usefulness of the disseminated material

and will consider their suggestions for future research and communications.

This plan aims to ensure that the study's results are shared effectively and empathetically, providing valuable and relevant information to patients and their families, and fostering greater understanding and dialogue between the scientific community and patients.

IV. UNDERSTANDING PERCEIVED BURDEN

To assess the perceived burden on participants, we considered the duration of the questionnaire, estimated at around 20 minutes. Patients were asked to provide feedback on whether this time was manageable and if the experience of completing the questionnaire was emotionally or physically demanding. Additionally, we explored whether participating in the study caused any inconvenience or additional stress, beyond the time spent on completing the questionnaire.

V. MEASUREMENT OF PARTICIPATION TIME

The time each participant spent completing the questionnaire was accurately recorded, establishing an average of 20 minutes. This objective measure of time spent provided a basis for assessing the time demand

of the study and its acceptability to patients. Furthermore, this record allowed for a comparison to see if there were significant variations in response time, which could indicate differences in comprehension or response capacity among participants.

VI. ETHICAL CONSIDERATIONS

The study was conducted following international ethical standards for biomedical research, namely the 'MERCOSUR Standards on clinical trials regulation' and the 'Declaration of Helsinki', and with the research regulations approved by the National Ethics Committee in 2019. Patient anonymity was ensured during the analysis of the results, and the study was approved by the Ethics Committee of the Hospital de Clínicas.

VII. RESULTS

The study included 59 patients, with 50.84% being male and 54.2% living in Montevideo. The average age was 57.2 years, ranging from 25 to 84 years. A total of 66.1% of the participants reported having religious beliefs. Regarding marital status, 39% were married or in a common-law relationship, and 67.8% lived with their family. Additional details are provided in Table 1.

Table 1: Demographic Data (n=59)

Variables	Categories	Frequency	Percentage	RF
Gender	Male	30	50.84%	0.50
	Female	29	49.15%	0.49
Age	30-50	13	22.03%	0.22
	51-70	35	59.32%	0.59
	> 70	8	13.55%	0.13
Origin	Montevideo	32	54.23%	0.54
	Interior	27	45.76%	0.45
Marital Status	Married/Free Union	23	38.98%	0.38
	Single	17	28.81%	0.28
	Separated/Divorced	11	18.64%	0.18
	Widow	7	11.86%	0.11
Educational Level	Incomplete Primary	8	13.55%	0.13
	Complete Primary	22	37.28%	0.37
	Incomplete Secondary	19	32.20%	0.32
	Complete Secondary	6	10.16%	0.10
	Incomplete Tertiary	3	5.08%	0.05
Living With	Graduate	1	1.69%	0.01
	Alone	11	18.64%	0.18
	Family	40	67.79%	0.67
	Nursing Home	4	6.77%	0.06
Primary Site	Breast	14	23.72%	0.23

Variables	Categories	Frequency	Percentage	RF
	Lung	13	22.03%	0.22
	Digestive	10	16.94%	0.16
	Otorhinolaryngological	6	10.16%	0.10
	Other	16	27.11%	0.27
Bone Metastases	Yes	22	37.28%	0.37
	No	37	62.71%	0.62
Children	Yes	50	84.74%	0.84
	No	9	15.25%	0.15
Religious Beliefs	Yes	39	66.10%	0.66
	No	20	33.89%	0.33

RF refers to Relative Frequency, which is the frequency relative to the total number of observations.

As for cancer types, 23.7% of diagnoses were breast cancer, followed by lung cancer at 22%, digestive tumors at 16.9%, and otolaryngological malignancies at 10.1%. Bone metastases were present in 37.3% of the patients.

At the time of the survey, the majority of patients did not report experiencing pain (62.1%), asthenia (fatigue) (70.7%), or dyspnea (shortness of breath) (98.3%).

Additionally, 71.2% of patients reported that the clinical approach taken did not delay their diagnostic or therapeutic process, 64.4% stated that the SARS-COV 2 pandemic did not cause delays in their diagnosis and

treatment, and 93.2% felt satisfied with the hospital care received prior to their admission to the oncology service.

a) HHI and FACT-G

The HHI revealed a high score among our patient population, with an average of 35.3 (SD 5.12). The average total FACT-G score was 51.5 (SD 9.73).

The Physical component of FACT-G had an average of 7.95 (SD 5.55). The average for the family component was 17.78 (SD 6.34). The Emotional component showed a low average of 8.36, which is positive as a lower score indicates a better emotional component (SD 4.47). Lastly, the personal component averaged 17.44 (SD 5.75) (Table 2).

Table 2: Scores of FACT-G y HHI.

Instruments	Items	Range	Mean	Standard Deviation
HHI	10	10 - 40	35.3	5.12
FACT-G Total	27	0 - 108	51.5	9.73
FACT-G Physical	7	0 - 28	7.95	5.55
FACT-G Family	7	0 - 28	17.78	6.34
FACT-G Emotional	6	0 - 24	8.36	4.47
FACT-G Personal	7	0 - 28	17.44	5.75

Abbreviations: HHI: Herth Hope Index, HHI: Functional Assessment of Cancer Therapy-General, FACT-G.

A positive correlation between HHI and the total FACT-G was observed, although it did not reach statistical significance ($p=0.05$). Similarly, significant

correlations were seen for FACT-G Physical ($p=0.019$), FACT-G Family ($p=0.010$), FACT-G Emotional ($p=0.016$), and FACT-G Personal ($p=0.032$) (Table 3).

Table 3: Correlation between HHI and FACT-G.

	HHI
FACT-G Total	
p	0.05
FACT-G Physical	
r	0.305
p	0.019
FACT-G Family	

	HHI
r	0.332
p	0.010
FACT-G Emotional	
r	0.519
p	0.016
FACT-G Personal	
r	0.279
p	0.032

The 'r' values represent Pearson correlation coefficients, which measure the strength and direction of the linear relationship between two variables, and the 'p' values indicate the statistical significance level of these correlations.

Regarding the univariate analysis, it identified three variables with statistically significant associations with the HHI, which were "Do you have any religious or spiritual beliefs?" ($p=0.029$), "Are you satisfied with the care received at the Clinical Oncology Service?" ($p=0.044$), and "Do you feel supported/contained by your family/friends/close circle?" ($p=0.003$).

Regarding the total FACT-G, the variables with statistically significant associations were "presence of bone metastases" ($p=0.041$), "Do you think that the clinical approach has delayed the diagnosis process of your disease?" ($p=0.035$), and "Do you have any family or friends who accompany you to the consultation?" ($p=0.012$). In relation to the other sociodemographic data acquired from the study participants, no statistically significant relationship was observed.

The scores of the indices were divided into ranges based on the results obtained. The table (Table 3) shows the qualitative relationship between FACT-G and the levels of hope according to the Herth Index.

Given that the majority of patients presented high scores, we divided the index into three groups.

Patients with a general physical FACT-G health score of 10 or less showed a higher HHI score, thus more hope. In the case of the 27 patients who had a familial and social FACT-G environment score of over 20 (we can also include those over 10), they showed a higher HHI score, therefore more hope. However, if we take into account patients with a familial FACT-G score of less than 10, the majority had a high HHI score, so it can be concluded that the family environment does not affect the level of hope. If we analyze the emotional FACT-G, 45 of the 59 patients had a score of less than 10, which is significant since a lower score indicates a better emotional state, and therefore, a better emotional state means more hope in most patients. In the case of the personal functioning FACT-G, 23 of the 59 patients had a score of over 20, which is better for their level of hope.

VIII. DISCUSSION

This pioneering study in the region investigates the relationship between hope and quality of life in oncological patients. With a sample of 59 patients, reflecting a balance in gender (50.8% male), geographic origin (54.2% from Montevideo), and an average age situated in the range most affected by oncological disease, our findings provide a representative perspective for the Uruguayan population. The most common types of cancer matched the main national incidences: breast, lung, and gastrointestinal.

The hypothesis of a positive correlation between quality of life and hope was examined using the Herth Hope Index (HHI) and the FACT-G, along with the Pearson correlation. The study period, July 2021-2022, in patients with advanced oncology at the Hospital de Clínicas, allowed a focused look at the interaction between emotional and physical well-being during critical stages of oncological treatment.

We found that the relationship between hope and quality of life, although not statistically significant, suggests a positive trend, hinting that higher levels of hope might be associated with better quality of life. It's likely that the lack of statistical significance is due to the limited size of our sample. However, the direction of the trend observed in the qualitative analysis supports this positive relationship. Grouping patients according to their responses to the FACT-G questionnaire demonstrated that those with higher hope tend to report a better overall quality of life.

According to the data collected and applying the Herth Index to measure hope, it has been observed that those patients who possess higher levels of hope tend to have a more positive outlook towards their future, which positively impacts quality of life and the ability to cope with treatment and pain⁽⁸⁻¹⁰⁾.

This link is corroborated by Rustøen et al., who demonstrate that lower levels of hope are associated with an increase in symptoms such as pain⁽¹¹⁾. The inclusion of measures to foster hope may be crucial in the clinical management of pain and psychological

distress. Despite the promise of these results, their applicability is limited by the sample size, which calls for future studies with larger groups for a more robust confirmation of these preliminary findings.

The findings suggest a positive association between hope and a lower perception of pain, although it did not reach statistical significance, possibly due to the sample size.

Consistent with the literature, patients in advanced stages of the disease maintain high levels of quality of life and hope^(12,13), potentially strengthened by the observed family support, a factor known to improve quality of life in palliative contexts.

Sociodemographic data did not show a significant influence on levels of hope and quality of life, indicating a minimal relationship in this study. Aspects such as the presence of children, whether they lived alone or with others, and the patient's age did not significantly alter the levels of hope, in line with previous studies suggesting the constancy of hope across different ages⁽⁸⁾.

We found that religious or spiritual beliefs were significantly associated with higher levels of hope ($p=0.029$), in agreement with previous research identifying social support, self-esteem, and spirituality as important elements for hope in cancer patients. Unlike studies focused on early stages of cancer, our work includes patients with advanced stages, and reaffirms that both social support and spirituality can be key in preventing depression and fostering hope^(14,15). Despite this, no significant differences in the level of hope were observed among different types of beliefs.

The results showed that an early diagnosis, perceived by patients as without undue delays, was significantly related to better quality of life ($p=0.035$). This finding highlights the importance of avoiding delays in diagnosis, a problem exacerbated during the COVID-19 pandemic, as shown by a study in Spain that documents a reduction in screening tests and biopsies. This study suggests that delays in diagnosis could impair quality of life, emphasizing the need for in-person care for early detection and proper cancer management⁽¹⁶⁾.

Despite controversy in the literature about the impact of certain sociodemographic and clinical factors on hope and quality of life, no significant differences were observed in our study, which may reflect the positive influence of comprehensive support. A study in Norway⁽¹¹⁾ also found no significant differences in these factors, which could be related to the effectiveness of their health support system. In our case, collaboration with Palliative Care, assistance from volunteers, constant psychological support, and socioeconomic aid contribute to mitigating potential inequalities, thereby favoring hope and quality of life in our patients.

A Chinese study⁽¹⁷⁾ found a positive correlation between hope, social support, and quality of life in

patients with oral cancer, similar to our finding that family support improves hope and quality of life ($p=0.003$). The lack of social support was linked to an increase in depression and anxiety, which could affect treatment outcomes. Another study in Tianjin⁽¹⁸⁾ also confirmed the importance of hope and social support for the quality of life in survivors of triple-negative breast cancer. Both studies support our results, underscoring the relevance of social and family support in the well-being of cancer patients.

Quality of life in cancer patients significantly improves without bone metastases ($p=0.041$), indicating a negative impact of these metastases on daily life due to pain and mobility restrictions⁽¹⁹⁾. A study on metastatic breast cancer with bisphosphonates showed an improvement in quality of life, although without differences in pain perception between bone and visceral metastases. However, Reed et al.⁽²⁰⁾ reported reduced quality of life in patients with bone metastases due to associated pain. On the other hand, it was observed that high levels of hope in patients with lung cancer correlate with fewer symptoms of pain and depression, highlighting the relevance of hope in the psychological adaptation to the disease⁽²¹⁾.

Studies highlight the correlation between hope and quality of life in oncological patients in hospice and palliative care, even when a cure is not possible. One study showed an increase in both parameters following a psychosocial intervention ($r = 0.597$, $P = 0.000$)⁽²²⁾. Satisfaction with oncological care, family support, and spiritual beliefs were linked to higher levels of hope and quality of life. These results are in line with previous literature^(8,23) and support the notion that better care quality improves symptom control and hope⁽²⁴⁾.

When considering the positive relationship that our data suggests between hope and quality of life, it is important to recognize that the limited sample size and the non-multicentric nature of our study could have influenced the representativeness of these findings. Moreover, the challenges faced by patients with pain, fatigue, and distress during the administration of the surveys could have introduced a bias in how they perceived and reported their levels of hope and quality of life. This highlights the need to use more robust and diversified data collection methods in future studies to minimize the influence of these variables. The implementation of such methods could clarify whether the observed trends hold in a larger and more varied sample, offering a deeper understanding of how hope can serve as a critical psychological resource for oncological patients.

IX. CONCLUSIONS

Our study suggests a positive correlation between hope and quality of life in advanced oncological patients in Uruguay, although not

statistically significant possibly due to sample size. Factors such as religious or spiritual beliefs, family support, and quality of care appear to contribute to hope. Bone metastases, diagnostic delay, and accompaniment in consultations influence quality of life. No significant relationships with other sociodemographic variables or symptom control were found, possibly due to sample size. The quality of care from the oncology service was decisive for hope, being a variable that the health team can directly influence.

Future interventions could focus on support programs to raise hope and quality of life for patients. Studies indicate that specific interventions, such as watching documentaries about hope, personal reflection activities, or mindfulness practices, can be effective in improving hope and, consequently, quality of life.

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Goldincision – A Multifactor Approach to Cellulite Treatment

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Abstract- Background: Gynoid lipodystrophy (GLD), popularly known as cellulite, is the result of fat deposits under the skin. It is characterized by structural, inflammatory, and biochemical disorders of the subcutaneous tissue that cause irregular dimpling of the epidermis. Among many treatments used for GLD, Goldincision® has proved to be effective, showing more significant and satisfactory results. Therefore, this work aimed to describe this technique.

Methodology: This is a multicenter observational study which analyzed the cases of 47 patients who were submitted to the Goldincision® technique in 2021, using the team's protocol for assessment, treatment, and follow-up.

Keywords: cellulite, gynoid lipodystrophy, treatment, aesthetics, goldincision.

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Goldincision– A Multifactor Approach to Cellulite Treatment

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Methodology: This is a multicenter observational study which analyzed the cases of 47 patients who were submitted to the Goldincision® technique in 2021, using the team's protocol for assessment, treatment, and follow-up.

Results: The cases of 47 female patients who underwent the Goldincision® technique were analyzed retrospectively. The average age of the participants was 39.48 years old. The regions where the technique was applied were the buttocks, thighs, posterior thighs, lateral thighs, and anterior thighs. Application area sizes ranged from small to medium, large, and extra-large. There was no significant association between the size of the application area and the number of sessions needed, with 2.23 being the average number of sessions required. Bleeding, hemosiderin staining, seroma formation, hematoma formation, nodule formation, and occasional pain were the complications associated with the technique.

Conclusion: This study described the Goldincision® technique as a treatment for gynoid lipodystrophy. The technique proved to be effective in the treatment of advanced gynoid lipodystrophy.

Keywords: cellulite, gynoid lipodystrophy, treatment, aesthetics, goldincision.

I. INTRODUCTION

Gynoid lipodystrophy (GLD), also known as adiposis edematosa and popularly called cellulite, is the result of fat deposits under the skin. It is characterized by structural, inflammatory, and biochemical disorders of the subcutaneous tissue that cause irregular dimpling of the epidermis. The noticeable changes consist of protrusions, caused by fat and subcutaneous structures protruding into the dermis, and depressions, caused by skin retraction due to subcutaneous fibrous septa.^{1,2,3,4}

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The primary factor for the development of gynoid lipodystrophy is the presence of estrogen; therefore, it occurs almost exclusively in women. Its onset is common after puberty and can be exacerbated in periods of increased hormone levels such as during pregnancy, breastfeeding, menstruation, and the use of oral hormonal contraceptives. GLD affects mostly the subcutaneous tissues around the thighs, buttocks, and hips, where there is greater adipose tissue deposition in female patients due to the presence of estrogen.^{1,2,3}

One of the theories that may explain the appearance of cellulite is related to the occurrence of edema in the connective tissue, which causes a large water accumulation. Another hypothesis is the compression of the venous and lymphatic systems, mainly due to obesity, which alters the microcirculation.^{2,5} A third possibility is that it may be associated with the different arrangement of the connective tissue fibers – perpendicular in women and oblique in men^{6,7} – which could explain the higher incidence of GLD in female patients. The appearance of this condition can also be influenced by reduced collagen, stress, sedentary lifestyle, obesity, heredity, use of hormonal contraceptives, age, pregnancy, and nutrition, among other factors.⁸

Gynoid lipodystrophy is a complex and multifactorial condition, and its real causes and/or predispositions are yet to be determined. Therefore, it is still difficult to achieve significant efficacy in the treatments used.^{1,2}

There are non-invasive treatments, such as topical therapies, oral therapies, endermology, cryolipolysis, ultrasound, infrared light, intense pulsed light, extracorporeal pulse activation therapy, and radiofrequency, used to combat cellulite. Moreover, minimally invasive treatments such as carboxytherapy, mesotherapy, subcision, and Goldincision®^{2,3,9,10} can also be used to this end.

a) Goldincision®

Goldincision® is a technique developed for the treatment of more advanced grades of cellulite, according to the classification of Nürenberger and Müller.⁶ It combines subcision with biostimulation of neocollagenesis using particulate products: polylactic acid, calcium hydroxyapatite, polycaprolactone and,

mainly, polymethylmethacrylate to obtain a more satisfactory result^{11,12}.

Polymethylmethacrylate (PMMA) is a polymer used as a tissue filler in the form of synthetic microspheres with diameters between 40 and 60 μm . These microspheres may be suspended in a solution of collagen, be it protic or crystalloid, which is injected with microcannulas without cuts or surgeries. Currently, with the fourth generation of PMMA, a perfect granulometry can be observed. Due to its lack of impurities and regular surface, it provides a greater area of contact with the tissue and, consequently, faster tissue fixation¹³.

The commercial product may vary between 2%, 5%, 10%, 15%, and 30%, depending on the concentration of PMMA. It has a permanent effect, as only the vehicle is absorbed, and tissue biostimulation occurs around the particles. Considering its property of stimulating neocollagenesis through a controlled inflammatory response^{13,14}, PMMA can also be used as

a biostimulator when in small amounts and evenly distributed in the subdermal plane at a concentration of 10%.

Subcision is the undermining of fibrous septa in selected areas. This technique, despite apparent clinical improvement in some cases, leaves something to be desired. There may be cases of new adhesion of the same treated septum, ineffectiveness, and frequent complications such as seromas and hematomas, in addition to limited results in isolated areas without relevant neocollagenesis^{12,15}.

Goldincision® is used not only for sectioning fibrous septa (Figure 1) but also for general collagen biostimulation (Figure 2), improving sagging, circulation, local metabolism and lymphatic drainage (involved in cellulite genesis). Post-procedure care prevents adverse effects and scars, making Goldincision® a successful treatment which results in a high degree of satisfaction among patients and professionals¹².

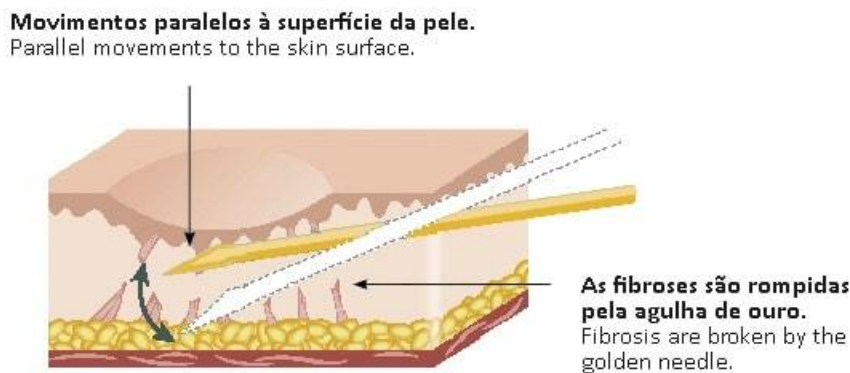


Figure 1: Sectioning of the septa with the Goldincision technique. Source: <https://goldincision.com.br/tratamento-celulite-subcisao-preenchimento/>

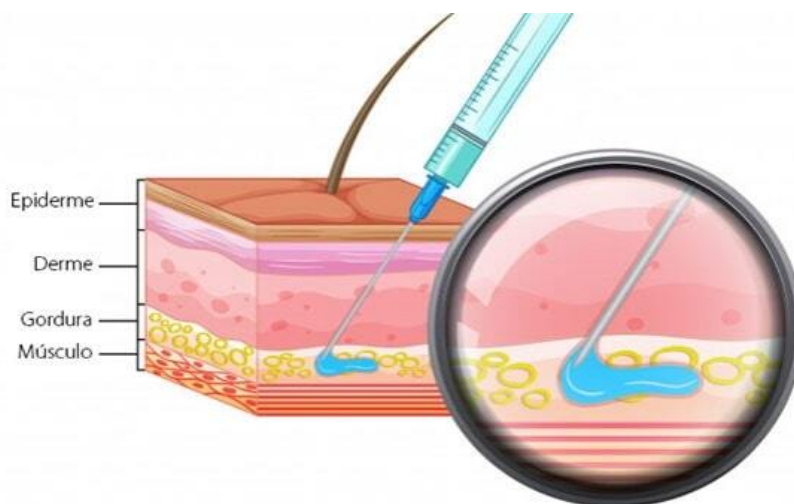


Figure 2: Application of collagen biostimulant with PMMA using the Goldincision technique. Source: <https://goldincision.com.br/tratamento-celulite-subcisao-preenchimento/>

II. METHODOLOGY

This is a multicenter observational study. The case records of 47 patients who were submitted to the Goldincision® technique in 2021, using the team's protocol for evaluation, treatment, and follow-up, were evaluated. This study was approved by the Research Ethics Committee under protocol number 30867114.3.0000.5333.

Inclusion criteria were female patients with advanced grades of gynoid lipodystrophy. Exclusion criteria were patients who had hyaluronic acid, hydrogels, and biopolymers in the treated region. Pregnant patients were also excluded, along with those who were breastfeeding or had a low degree of gynoid lipodystrophy.

The evaluation criteria were the age of the patients, recommended treatment area size, number of sessions performed, volume used in each session, and adverse effects.

a) Description of the technique

After the individual assessment of the patient by the professional, the former signed an informed consent form and had their photographic record taken. The Goldincision® procedure may be summarized as follows

- A – Preparation for the procedure;
- B – Marking of skin depressions;
- C – Asepsis;
- D – Local anesthesia;
- E – Biostimulation of neocollagenesis;
- F – Sectioning of the fibrous septa;
- G – Compressive dressings.

A. Preparation of the room and opening of sterile supplies for the procedure.

Sterile field, gloves, and gauze are used to prepare the materials. For the procedure, an 18G malleable cannula with a blunt, atraumatic tip, an 18G needle, 2% lidocaine, sterile saline for the dilution of the anesthetic, anesthesia syringe, and biostimulator are used.

B. Marking of the skin depressions.

The depressions are marked immediately before the procedure with the patient standing in a relaxed position.

With the patient in an upright position, the septa are marked for further sectioning.

C. Local disinfection.

With the patient in the prone position, skin disinfection of the site is performed before the procedure.

D. Local anesthesia is performed by cutaneous infiltration of lidocaine.

After disinfection of the area, local anesthesia is performed using 2% lidocaine with vasoconstrictor

diluted in sterile saline (1:1). An 18G needle is used to open the entry point for an 18G malleable cannula with a blunt, atraumatic tip. Local anesthesia infiltration is performed considering the maximum amount of anesthetic calculated by the patient's weight, generally 0.2 mL of lidocaine per kg or 0.4 mL of solution per kg.

E. Biostimulation of neocollagenesis.

After local anesthesia, the biostimulation of neocollagenesis with 15% PMMA is carried out, helping to stimulate the production of neocollagen and the improvement of local circulation. The objective of this step is to improve the overall quality of the skin, improve vascularization, collagen and metabolism in the entire region.

This step is performed with the patient in the prone position using an 18G malleable cannula with a blunt, atraumatic tip. The biostimulator is injected in a retrograde, fan-like fashion to homogeneously distribute the particulate product into the subcutaneous tissue throughout the region and not only in the depressions, and before fibrous septum detachment. Thus, it is possible to avoid the accumulation of product and the formation of nodules.

F. Sectioning of the fibrous septa using a needle.

After the biostimulation of the region, the sectioning of the subcutaneous septa is done using an 18G needle. For a clear view of the sectioning, it should be performed with the patient standing, so that skin undermining is kept to a minimum, just enough to even out apparent irregularities. During the procedure, some blood vessels close to the septa might be cut, resulting in the formation of transient ecchymoses with a risk of hematoma and seroma. These may be avoided with local compression during the first 24 hours. The presence of one or more surgical assistants throughout the procedure is important to maintain immediate compression of the septa after skin undermining.

G. Compression dressings on undermined areas.

A compression dressing is applied to the undermined area (figure 3). The patient is instructed to keep it for 24 hours before removal. A compression garment is also worn right after the procedure. The patient must continue wearing it for at least seven days.



Figure 3: Compression dressing on the undermined areas and compression garment. Source: Own figure.

After the procedure, the patient is instructed to wear the compressive shorts for at least seven days and not to do any physical activity until the dressings are

removed (24 hours), as well as being encouraged to perform local lymphatic drainage.



Figure 4: Ecchymosis after 7 days of Goldincision treatment. Source: Own figure.

b) *Goldincision kit*

The post-treatment guidelines were associated with the use of the post-Goldincision® kit (figure 5). It consists of the use of an antithrombotic ointment made with heparin, vitamin K1, and Methyl Nicotinate, the

ingestion of arnica pellets containing CH5, Echinacea D2, and Calendula D2, and subsequent use of a depigmenting cream with tranexamic acid, thioglycolic acid, and Haloxyl. This way, it is possible to minimize the main adverse effects of the procedure.



Figure 5: Post-Goldincision kit. Source: Own figure.

III. RESULTS

The cases of 47 female patients who underwent the Goldincision® technique were analyzed retrospectively. The average age of the participants was 39.48 years old. The regions where the technique was applied were the buttocks (n=32; 68.08%); the buttocks

and posterior thighs (n=6; 12.76%); the buttocks and posterior and lateral thighs (n=2; 4.25%); posterior thighs (n=2; 4.25%); buttocks and thighs (n=4; 8.51%); and buttocks, anterior and posterior thighs (n=1; 2.12%), as seen in Table 1.

Table 1: Region of application of the Goldincision® technique.

Region	N	%
Buttocks	32	68.08%
Buttocks and posterior thighs	6	12.76%
Buttocks and posterior and lateral thighs	2	4.25%
Posterior thighs	2	4.25%
Buttocks and thighs	4	8.51%
Buttocks and anterior and posterior thighs	1	2.12%

The application area sizes ranged from small (n=8; 17.02%) to medium (n=26; 55.31%), large (n=11; 23.40%), and extra-large (n=2; 4.25%), as shown in Table 2. There was no significant association between

the size of the application area and the number of sessions needed, with 2.23 being the average number of sessions.

Table 2: Size of the area of application of the Goldincision® technique.

Size	N	%
Small	8	17.02%
Medium	26	55.31%
Large	11	23.40%
Extra large	2	4.25%

The number of sessions is related to the body's response to the applied stimulus. All the patients (n=47) were submitted to the first session (Figure 6) of the technique (subcision=47, biostimulus=44); 80.85% (n=38) underwent a second session (Figure 7) (subcision=38, biostimulus=28); 38.29% (n=18)

underwent a third session (Figure 8) (subcision=18, biostimulation=7); and 4.2% (n=2) underwent a fourth session (Figure 9) which consisted only of the subcision of some remaining septa. A fifth session was not necessary for any of the patients in the analysis group.

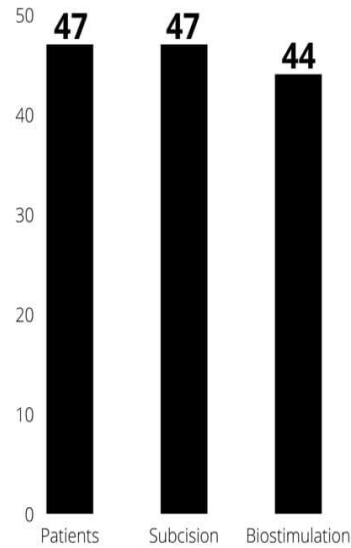


Figure 6: First session using the Goldincision® technique. Source: Own figure.

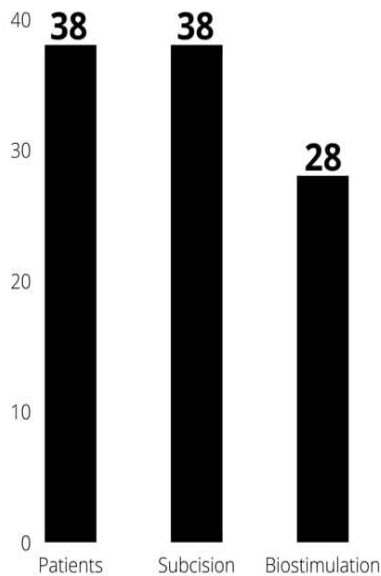


Figure 7: Second session using the Goldincision® technique. Source: Own figure.

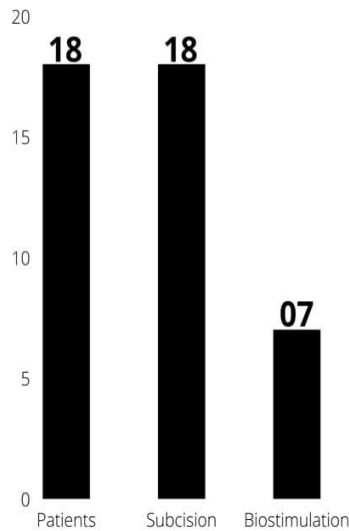


Figure 8: Third session using the Goldincision® technique. Source: Own figure.

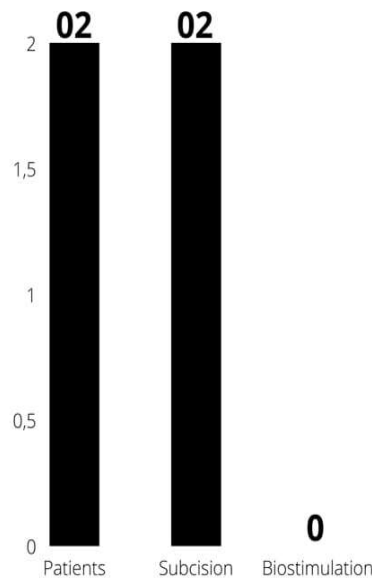


Figure 9: Fourth session using the Goldincision® technique. Source: Own figure.

The mean volume of 15% polymethylmethacrylate used per session was 39.48 mL in the first session, 21.82 mL in the second session, and 12.85 mL

in the third session. Biostimulation of neocollagenesis with the particulate product was not used in the fourth session, as shown in Table 3.

Table 3: Mean volume used per session of the Goldincision® technique.

Volume per session	N	Mean volume 10%
Session 1	44	39.48 mL 15%
Session 2	28	21.82 mL 15%
Session 3	7	12.85 mL 15%
Session 4	No biostimulation	-

As shown in Table 4, internal bleeding (n=47; 100%), hemosiderin staining (n=7; 14.89%), seroma formation (n=1; 2.12%), hematoma formation (n=1;

2.12%), nodule formation (n=1; 2.12%), and occasional pain (n=1; 2.12%) were the complications associated with the technique.

Table 4: Complications associated with the Goldincision® technique.

Complication	N	%
Bleeding	47	100%
Hemosiderin staining	7	14.89%
Seroma formation	1	2.12%
Hematoma formation	1	2.12%
Nodule formation	1	2.12%
Occasional pain	1	2.12%



Figure 10: Patient, 42 years old, submitted to 2 sessions of Goldincision treatment. In the first session, 39ml of PMMA was used to biostimulate the region and the fibroussepta were sectioned. The second session was performed 42 days after the first, with only the section of the remaining septa, no product was used again. First photo taken before the procedure and the second photo taken 3 months after the second session. Source: Own figure.



Figure 11: Patient, 43 years old, submitted to 1 session of Goldincision treatment. 45ml of PMMA was used to biostimulate the region and the fibroussepta were sectioned. First photo taken before the procedure and the second photo taken after 71 days. Source: Own figure.

IV. DISCUSSION

Gynoid lipodystrophy presents a clinical aspect of irregular appearance of the epidermis. A fibrotic band can be seen in 97.6% of the cases, especially when related to poor local circulation and metabolic insufficiency^{16,17}.

According to the Brazilian Society of Dermatology, gynoid lipodystrophy affects 95% of women after puberty, having a significant negative impact on personal, professional, and social levels¹⁸.

As it is a condition with a high level of complexity, studies on the creation and improvement of treatment techniques are regularly carried out. In 1997, the subcision technique was described for the treatment of gynoid lipodystrophy grades 3 and 4 (according to the Nürenberger and Müller classification). It consists of skin undermining for the sectioning of the fibrous septa in selected areas; however, this technique alone has limited results since the production of neocollagen is not significant¹⁹.

We do not use the term Subcision™ because this technique has the concept of not using a product and/or association of fillers and biostimulators¹⁴. The Goldincision® technique was developed to meet the needs of patients with advanced lipodystrophy. The noteworthy effects of the technique are related to its methodology, which associates stimulation of neocollagenesis with subcision, providing the undermining of fibrotic retraction but also improving the quality of the skin as a whole, improving not only the point-to-point treatment in a more effective way with the patient standing and a whole evaluation and follow-up protocol, but acting on the genesis of cellulite, resulting in an improvement of cellulite in all degrees with restructuring of collagen, a component of local metabolism, and neovascularization¹².

V. CONCLUSION

This study described the Goldincision® technique for the treatment of gynoid lipodystrophy. It proved to be effective and safe in improving the quality of the skin and sectioning the fibrous septa; thus, providing a homogeneous skin appearance. The treatment must be prescribed and performed by a professional who is trained to perform the technique, understands the associated adverse effects, and has the resources and scientific knowledge to deal with them, ensuring patient safety.

The positive clinical effects of Goldincision® on the treatment of gynoid lipodystrophy were evident, and its use is very promising as the main minimally invasive treatment for this condition.

Financial Disclosure and Products Page

All authors have no commercial interests or financial relationships with any of the products, devices

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Acknowledgments

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The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.



Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

- a) A title which should be relevant to the theme of the paper.
- b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
- c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
- d) An introduction, giving fundamental background objectives.
- e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
- f) Results which should be presented concisely by well-designed tables and figures.
- g) Suitable statistical data should also be given.
- h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

- i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
- j) There should be brief acknowledgments.
- k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.



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The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

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A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in a research paper?" Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.



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Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

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1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

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12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.



20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

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The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

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Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

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- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.



The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
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Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

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Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

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- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

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Put figures and tables, appropriately numbered, in order at the end of the report.

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Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."



Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

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- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
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<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



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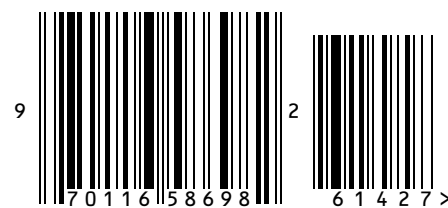
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