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THE RISK ASSESSMENT OF TEETH LOSS IN CANCER PATIENTS AFTER COVID-19

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თამუნა დუნდუა, ვლადიმერ მარგველაშვილი

კბილების დაკარგვის რისკის შეფასება ონკოპაციენტებში COVID-19-ის შემდეგ

ი.ჯავახიშვილის სახ. თბილისის სახელმწიფო უნივერსიტეტი, მედიცინის ფაკულტეტი, საქართველო

რეზიუმე

პირის ღრუს ჯანმრთელობაზე ზრუნვა და რეგულარული მონიტორინგი მნიშვნელოვანია კიბოს თერაპიის ყველა ეტაპზე - თერაპიამდე, თერაპიის დროს და თერაპიის შემდეგ - დაუყოვნებელი და ხანგრძლივი გართულებების თავიდან ასაცილებლად და სამართავად. ყველაზე გავრცელებული პრობლემები აღინიშნება თავისა და კისრის რადიოთერაპიისა და ქიმიოთერაპიის დროს, რაც აჩენს პირის სიმშრალეს, ქსოვილების დაზიანებას და ზრდის ინფექციებისა და კბილთა კარიესის განვითარების რისკს; სრულფასოვანი სტომატოლოგიური მეთვალყურეობა ხელს უწყობს კიბოს მკურნალობის უარყოფითი ზემოქმედების შემცირებას პირის ღრუს ჯანმრთელობაზე და ეხმარება პაციენტს ცხოვრების ხარისხის შენარჩუნებაში. **კვლევის მიზანია** შევაფასოთ კბილების დაკარგვის მასშტაბი იმ ონკოპაციენტებში, რომლებმაც გადაიტანეს COVID-19.

მასალები და მეთოდები. კვლევაში მონაწილეობა მიიღო 213-მა პაციენტმა, რომლებიც ჯანმრთელობის მდგომარეობის მიხედვით დაიყო ოთხ ჯგუფად: ჯანმრთელი პაციენტები COVID-19-ის გარეშე (20 პაციენტი), ჯანმრთელი პაციენტები COVID-19-ით (60 პაციენტი), ონკოპაციენტები COVID-19-ის გარეშე (48 პაციენტი) და ონკოპაციენტები COVID-19-ით (85 პაციენტი). კვლევის საწყის ეტაპზე განვიხილეთ, რამდენად ხშირად ჰქონდათ პაციენტებს დაკარგული 10-ზე მეტი კბილი ჯანმრთელობის სტატუსის გათვალისწინებით. 10-ზე მეტი კბილის დაკარგვა სხვადასხვა მიზეზით დაფიქსირდა ყველა ტიპის კიბოს მქონე პაციენტში. კიბოს ხანგრძლივობასა და მკურნალობას მნიშვნელოვანი გავლენა ჰქონდა კბილების დაკარგვაზე. რეგრესიული ანალიზით გამოვლინდა პროგნოზული ფაქტორები, მათ შორის ბუსტერის დოზის გამოყენება.

შედეგები. კიბოს მკურნალობის ყველა ფორმა - ქიმიოთერაპია, რადიოთერაპია და მიზნობრივი თერაპიები - მნიშვნელოვნად ზრდის კბილების დაკარგვას სხვადასხვა მიზეზით. აღნიშნულ მკურნალობებს შეიძლება ჰქონდეს სერიოზული გავლენა პირის ღრუს ჯანმრთელობაზე, რადგან ისინი იწვევენ ისეთ გართულებებს, როგორიცაა: პირის ღრუს სიმშრალე (ქსეროსტომია), ნერწყვის ნაკადის შემცირება, ღრძილების ანთება და ინფექციებისადმი მომატებული მგრძნობელობა.

დასკვნები. პირის ღრუს ჯანმრთელობაზე ზრუნვა - მათ შორის რეგულარული ჰიგიენა, კბილთაშორისი სივრცეების გასუფთავება და პროფესიონალური შემოწმებები - კრიტიკულად მნიშვნელოვანია კბილების დაზიანებისა და დაკარგვის პრევენციისთვის. ასევე, COVID-19-ის ვაქცინაცია შესაძლოა იძლეოდეს გარკვეულ დაცვას და ამცირებდეს სიმპტომების სიმძიმესა და მის უარყოფით ზემოქმედებას პირის ღრუს ჯანმრთელობაზე.

ჩემს ღრმა მადლიერებას გამოვხატავ პროფესორ ანა მარგველაშვილის მიმართ მისი კრიტიკული ხედვებისა და გააზრებული რეკომენდაციებისათვის, რომლებმაც გადამწყვეტი როლი შეასრულეს ნაშრომის საბოლოო ვერსიის ჩამოყალიბებაში.

Introduction. A growing body of scientific research has demonstrated a strong association between periodontal disease and a range of systemic conditions [1]. These include chronic illnesses such as diabetes mellitus, which impairs blood sugar regulation, and cardiovascular diseases, which affect the heart and vascular system [2]. Additionally, periodontal disease has been linked to respiratory infections such as pneumonia [3], as well as metabolic syndrome - a cluster of risk factors that elevate the likelihood of heart disease and stroke [4].

Recent findings suggest that teeth loss may emerge as a long-term consequence of covid-19. Researchers have discovered that the virus has the potential to trigger severe inflammation in the gums, which can weaken the supporting structures of the teeth over time [5]. This inflammatory response may lead to the gradual deterioration of periodontal health, ultimately resulting in unexpected tooth loss in some patients [6]. Since the covid-19 is known to affect the vascular and immune systems [7], it may disrupt the normal healing process within the oral cavity, making individuals more susceptible to oral diseases and complications. These observations highlight the need for further research to see the link between covid-19 and oral health, as well as the importance of maintaining good dental hygiene during and after infection.

Numerous epidemiological and pathological studies have highlighted a significant connection between poor oral health and various systemic diseases [8]. In particular, periodontal disease has been linked to a higher risk of developing non-communicable diseases (NCDs) [9,10]. These include serious conditions such as cardiovascular diseases, certain types of cancer, diabetes, Alzheimer's disease, and infections affecting the respiratory tract. Although, maintaining good oral hygiene and seeking timely dental care may play a crucial role in reducing the risk of these systemic health complications.

A growing body of evidence suggests that pre-existing medical conditions significantly impact the clinical outcomes of patients diagnosed with covid-19. Various studies have demonstrated that individuals with underlying health issues are more likely to experience severe symptoms and complications [11]. Identifying potential risk factors at an early stage could assist healthcare professionals in recognizing patients with a higher likelihood of developing a poor prognosis. Among these risk factors, researchers have proposed a possible link between poor oral health and the severity of covid-19 progression. This hypothesis suggests that maintaining good oral hygiene may play a role in reducing the risk of severe complications associated with the covid-19 virus [12].

In a retrospective pilot study, a connection was found between the severity of covid-19 and both alveolar bone loss and teeth loss [13]. However, it was noted that these factors are not independent risk factors that suggests severity of covid-19 may contribute to dental issues; other underlying factors may also play a significant role in the development of these oral health problems.

Breast, cervical, ovarian, and uterine cancers are major health concerns affecting women globally. As the global female population continues to grow alongside rapid social progress, the incidence of these cancers is steadily increasing, particularly among women of reproductive age. Breast cancer remains one of the most frequently diagnosed cancers in women worldwide, while cervical cancer continues to be a leading cause of cancer-related mortality in many developing nations. Although ovarian and uterine cancers occur less frequently, they still represent serious malignancies within the female reproductive system [14]. The objective of our research is to evaluate the extent of teeth loss in cancer patients who have contracted covid-19. Specifically, we aim to investigate how the combination of cancer and covid-19 infection impacts oral health, particularly the occurrence of teeth loss, to better understand the potential and contributing risks factors.

Materials and methods. The study involved 213 Georgian citizens aged between 18 and 65 years. The participants were categorized into different groups based on their health status: 20 individuals healthy and without cancer, 60 healthy who contracted covid-19, 48 cancer patients who had not experienced covid-19, and 85 cancer patients who also had contracted covid-19. The participants were then divided into two subgroups: Group I included individuals who had lost fewer than 10 teeth for any reason, and Group II consisted of those who had lost 10 or more teeth. In the initial phase of the study, we focused on examining how frequently patients lost more than 10 teeth, taking into account their specific health

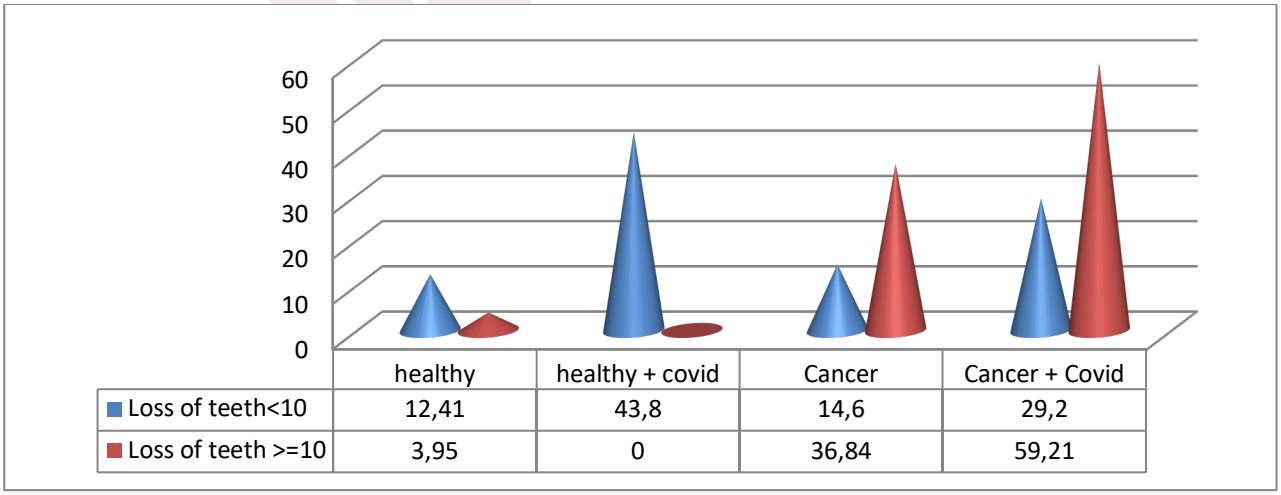
conditions. Teeth loss exceeding 10 teeth for various reasons was observed across all types of cancer. The influence of cancer duration and treatment on teeth loss is significant. Regression analysis revealed predictive factors with the use of a booster dose.

Statistical Analysis. We used the statistical software package SPSS 23.

- When evaluating quantitative indicators, we calculate the mean, standard deviation, and for qualitative indicators, frequency and percentage were calculated;
- The reliability of the difference between groups in the case of quantitative indicators was determined using the Student's criterion, when comparing, the equality of variances was assessed according to Levene's Test, for qualitative indicators, the difference between groups was assessed using the F (Fisher) criterion;
- Correlations between qualitative factors were determined using Spearman's rank correlation, and in case of quantitative factors - using Pearson's correlation analysis;
- Relative odds were determined using regression analysis.

Results. The initial phase of the study aimed to identify any patterns or correlations between teeth lost and the different statuses of the participants, such as whether they were healthy, had cancer, or had contracted covid-19. The study revealed a significant increase in teeth loss among cancer patients, particularly those who had also contracted covid-19. Statistical analysis showed that individuals in these groups were markedly more likely to have lost more than 10 teeth compared to healthy individuals or those with covid-19 alone. Older age (especially over 50), poor oral hygiene, and diabetes were also associated with greater teeth loss. Conversely, receiving a covid-19 booster dose and maintaining good oral hygiene were linked to a reduced risk. Chemotherapy, radiation, and extended treatment cycles significantly contributed to dental deterioration, underscoring the compounding effect of cancer therapies on oral health [15]. Regression analysis confirmed cancer, covid-19, and advanced age as strong predictors of extensive teeth loss, highlighting the need for targeted dental interventions in vulnerable populations.

Diagram 1. Distribution of Patients According to Teeth Loss



	healthy	healthy + covid	Cancer	Cancer + Covid
Loss of teeth<10	12,41	43,8	14,6	29,2
Loss of teeth >=10	3,95	0	36,84	59,21

In healthy individuals, the proportion of patients who has lost 10 or fewer teeth for any reason was notably higher, with statistical analysis showing a significant difference ($F=4.16$, $p=0.0428$). Among those who were healthy but had contracted covid-19, no patient has lost more than 10 teeth. On the other hand, in the groups of cancer patients and those with both cancer and covid-19, there was a significantly greater number of individuals with such loss. The statistical results for the cancer group were $F=14.68$, $p=0.0002$, while for the combined cancer and covid group, the results were even significantly higher, with $F=58.66$, $p<0.0001$. This suggests a clear association between the severity of the patients' conditions and the extent of teeth loss.

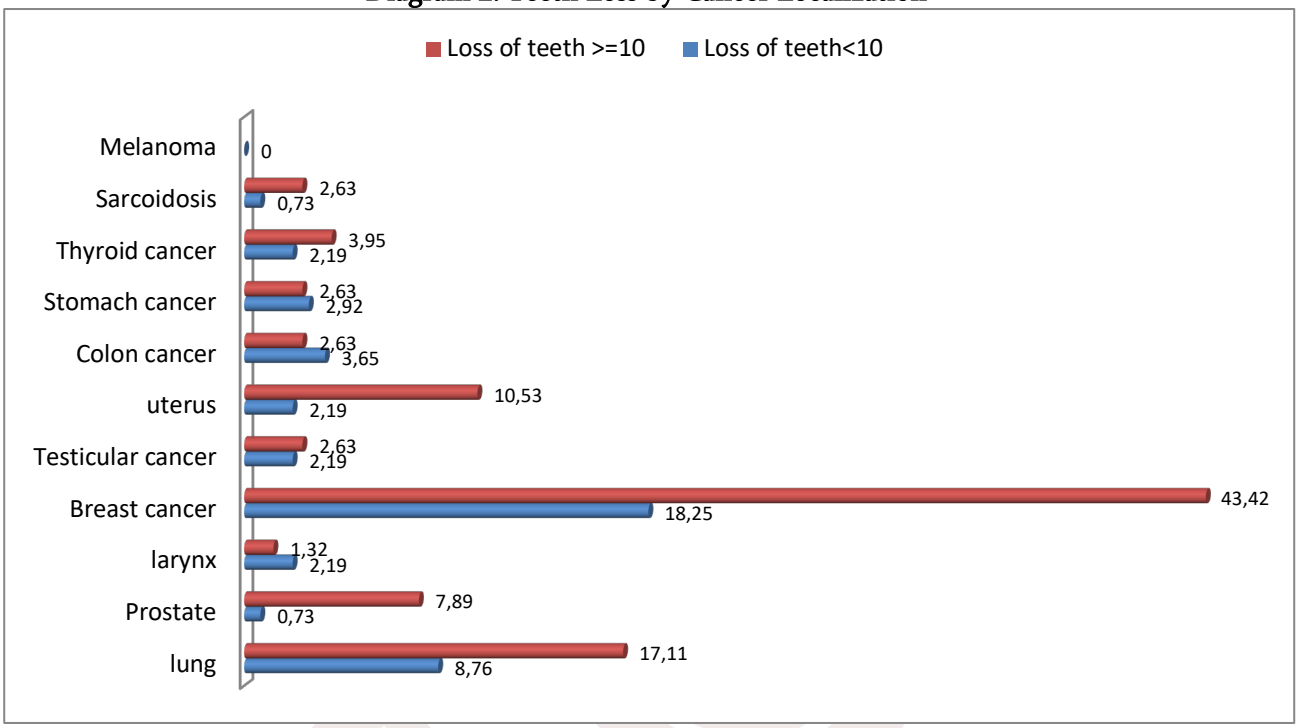
The statistical analysis of teeth loss, specifically the loss of 10 or more teeth, in relation to covid-19 and cancer is presented in Table 1. This table shows how the occurrence of teeth loss varies among the different patient groups, emphasizing the correlation between the severity of covid-19 and cancer conditions and the extent of teeth loss. The data in this table demonstrates to further clarify the impact of these health conditions on oral health. Among male patients, the rate of losing more than 10 teeth was slightly lower; however, the difference was not statistically significant. In the group with extensive teeth loss, a clear variation in age distribution was observed. Notably, individuals aged 18-35 were underrepresented, while those over 50 were significantly more prevalent. These findings offer advanced age, which is associated with a higher risk of substantial teeth loss, whereas younger individuals are less likely to experience severe dental deterioration. Group I, composed of individuals who has lost fewer than 10 teeth, showed a significantly higher rate of good oral hygiene practices. This indicates a strong association between proper oral care and a reduced risk of teeth loss. In contrast, Group II, which included those who has lost 10 or more teeth, exhibited a higher prevalence of diabetes. This suggests a possible connection between chronic conditions such as diabetes and more severe dental deterioration, likely due to the negative impact of the disease on oral health. No significant differences were found between the groups regarding the severity of covid-19 infection. However, a larger proportion of participants in Group I had received a booster dose of the covid-19 vaccine. This finding implies that while the severity of infection and vaccination status did not directly influence teeth loss, individuals with better oral health were more likely to have been vaccinated with a booster dose.

Table 1. Statistical Evaluation of Teeth Loss After Covid-19

Factors	Loss of teeth<10 (137)		Loss of teeth>=10 (76)		F	p
	n	%	n	%		
Healthy	17	12.41	3	3.95	4.16	0.0428
Healthy+Covid	60	43.80	0	0.00	58.66	0.0000
Cancer	20	14.60	28	36.84	14.68	0.0002
Cancer+Covid	40	29.20	45	59.21	19.91	0.0000
Male	61	44.53	24	31.58	3.44	0.0650
18-35	28	20.44	3	3.95	11.15	0.0010
35-50	54	39.42	21	27.63	2.99	0.0853
51-60	22	16.06	25	32.89	8.30	0.0044
>60	33	24.09	27	35.53	3.18	0.0761
<0.6 – Good Oral Hygiene	27	19.71	5	6.58	6.75	0.0101
0.7-1.6 - Satisfactory	84	61.31	49	64.47	0.21	0.6501
1.7-2.5 - Unsatisfactory	21	15.33	15	19.74	0.67	0.4132
>2.6 - Bad	4	2.92	5	6.58	1.61	0.2053
Malignant tumor (oral cancer)	0	0.00	0	0.00	0.00	0.00
Leukoplakia	0	0.00	0	0.00	0.00	0.00
Lichen	0	0.00	1	1.32	1.81	0.1800
Ulcer	7	5.11	4	5.26	0.00	0.9615
Acute necrotizing ulcerative gingivitis	6	4.38	1	1.32	1.44	0.2315
Fungal disease	3	2.19	3	3.95	0.55	0.4600
Abscess	0	0.00	0	0.00	0.00	0.00
Other condition	1	0.73	3	3.95	2.76	0.0984
Systemic diseases	44	32.12	27	35.53	0.25	0.6151
Cardiovascular system pathology	4	2.92	2	2.63	0.01	0.9037
Diabetes	3	2.19	7	9.21	5.47	0.0202

Other	35	25.55	19	25.00	0.01	0.9303
Mild Covid	76	55.47	31	40.79	4.20	0.04050
Moderate Covid	13	9.49	7	9.21	0.48	0.9517
Severe Covid	11	8.03	7	9.21	0.09	0.7678
Covid vaccine	57	41.61	38	50.00	1.39	0.2397
Booster dose	61	44.53	18	23.68	9.42	0.0024

Diagram 2. Teeth Loss by Cancer Localization



Teeth loss exceeding 10 teeth for various reasons was observed across all types of cancer. However, significant differences were found specifically in patients with prostate, breast, and uterine cancers. The statistical analysis revealed notable variations in teeth loss among these cancer types: prostate cancer had a significant difference ($F=8.12$, $p=0.0048$), breast cancer showed an even more pronounced difference ($F=16.71$, $p=0.0001$), and uterine cancer also displayed a significant increase in teeth loss ($F=7.10$, $p=0.0083$). These findings point out that teeth loss is more prevalent in these particular cancer groups compared to other cancer types, suggesting a possible link between these cancers and increased dental complications.

Table 2. Evaluation of Teeth Loss Characteristics According to Cancer Course and Treatment

Factors	Loss of teeth <10 (137)		Loss of teeth >=10 (76)		F	p
	n	%	n	%		
Presence of metastases	15	10.95	25	32.89	16.48	0.0001
Surgical intervention	50	36.50	53	69.74	23.85	0.0000
4 courses	5	3.65	10	13.16	6.91	0.0092
6 courses	32	23.36	34	44.74	10.88	0.0011
8+ courses	15	10.95	19	25.00	7.38	0.0072
Hormone therapy	26	18.98	40	52.63	29.19	0.0000
Radiation therapy	32	23.36	43	56.58	26.35	0.0000
Prophylactic hormone therapy	24	17.52	28	36.84	10.28	0.0016
Prophylactic bisphosphonate	3	2.19	6	7.89	3.97	0.0477
Prophylactic immunotherapy	25	18.25	34	44.74	18.45	0.0000

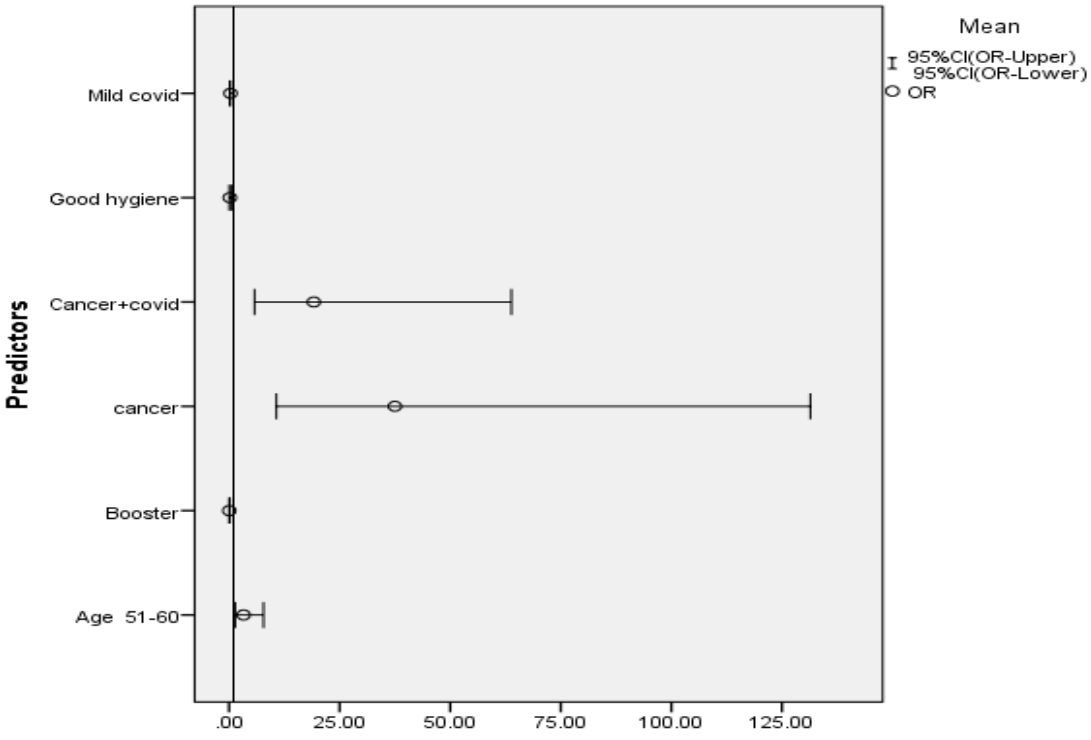
Relapse	9	6.57	13	17.11	5.97	0.0154
cancer duration less than 1 year	1	0.74	0	0	-	-
cancer duration1-5 year	26	18.98	33	43.42	15.51	0.0001
cancer duration more than 5 year	33	24.09	40	52.63	19.10	<0.0001
Presence of metastases	15	10.95	25	32.89	16.48	0.0001
Surgical intervention	50	36.50	53	69.74	23.85	<0.0001
4 courses	5	3.65	10	13.16	6.91	0.0092
6 courses	32	23.36	34	44.74	10.88	0.0011
8+ courses	15	10.95	19	25.00	7.38	0.0072
Not held	8	5.83	10	13.16	2.62	0.1071

The influence of cancer duration and treatment on tooth lost is significant. The frequency of metastases and surgical intervention is higher in the group 2 (non-cancer patients with covid).

Regarding chemotherapy, patients in the first group predominantly underwent four treatment cycles, whereas those in the second group were more likely to receive six or even eight cycles. Treatment protocols may reflect variations in clinical decision-making based on patient-specific factors, such as tumor progression, overall health status, and anticipated treatment outcomes. A reduction in the frequency of patients who loss more than 10 teeth was observed with the use of a booster dose. Regression analysis revealed predictive factors for more than 10 teeth loss.

Evaluation of more than 10 teeth loss due to any cause showed that the risk of teeth loss increases: Cancer+Covid OR=19.17 (95%CI:5.76-63.82), Cancer-OR=37.48 (95%CI:10.69-131.44), Age 51-60 years-OR=3.29 (95%CI: (1.38-7.80), Reduces - Good hygiene level - OR=0.20 (95%CI:0.06-0.65), Mild Covid - OR=0.32 (95%CI:0.12-0.85), booster dose of vaccine, chemotherapy increases the number of teeth loss in all cases.

Figure 1. Regression Analysis



Discussion. Scientific research has demonstrated a strong correlation between teeth loss and the severity of covid-19. In individuals beyond middle age, the primary cause of teeth loss is periodontal disease, a chronic inflammatory condition that progressively damages the supporting structures of the teeth [16]. Notably, chronic inflammation is also a key characteristic of severe covid-19 cases, suggesting

a potential link between oral health and the body's systemic inflammatory response [17]. This connection is further supported by elevated levels of C-reactive protein (CRP), a biological marker that indicates heightened inflammation in the body. The presence of high CRP levels in both periodontal disease and severe covid-19 cases reinforces the hypothesis that persistent inflammation, whether originating from the oral cavity or a viral infection, can exacerbate health complications [18]. These findings mark the importance of maintaining good oral health as a potential factor in reducing the risk of severe outcomes in infectious diseases like covid-19.

Despite the implementation of preventive treatments aimed at preserving oral health, there remains a noticeable rise in the incidence of teeth loss. This suggests that protective measures may not be entirely effective in halting the progression of underlying conditions, such as periodontal disease or systemic factors that contribute to dental deterioration. The persistence of teeth loss, even with preventive care, highlights the complexity of oral health management and the potential influence of additional risk factors, such as inflammation, genetic predisposition, or underlying medical conditions. This trend underscores the need for more advanced and individualized approaches to dental care in order to mitigate further deterioration and improve long-term oral health outcomes [19].

Our earlier research identified a connection between periodontitis and covid-19, suggesting that poor oral health may contribute to the severity of viral infections [20]. Furthermore, emerging studies suggest a potential relationship between periodontal disease and certain types of cancer, indicating that chronic inflammation in the oral cavity may play a role in the progression of malignancies [21]. These findings emphasize the significance of oral health not only in preventing local infections but also in reducing the risk of developing serious systemic diseases.

Our research findings indicate a clear correlation between teeth loss and aging, with the number of missing teeth increasing progressively as individuals grow older. Besides, we observed a significantly higher prevalence of diabetes among individuals who has lost more than ten teeth. This proposes a potential link between extensive teeth loss and metabolic disorders, possibly due to the shared underlying factor of chronic inflammation. Periodontal disease, a leading cause of teeth loss, is known to contribute to systemic inflammation, which is also a key factor in the development of diabetes [22]. These results highlight the importance of maintaining good oral health, not only to preserve dental function but also to reduce the risk of developing serious systemic conditions such as diabetes.

Research has revealed notable connections between periodontal disease and several types of cancers, including those affecting the lungs, kidneys, pancreas, and blood (hematological cancers) [23]. Among these, there has been a particularly marked increase in the incidence of hematological cancers. Our study further supports these findings, indicating that teeth loss is notably linked with cancers such as prostate, breast, and uterine cancer. While the precise mechanisms behind these associations remain under investigation, it is becoming increasingly evident that maintaining good oral health could be an important aspect of preventing or managing cancer risk, particularly for cancers with higher associations to oral conditions.

All forms of cancer treatment, including chemotherapy, radiation therapy, and targeted therapies, contribute to a significant rise in teeth loss from various causes. These treatments can have profound effects on oral health, as they often lead to complications such as dry mouth (xerostomia), reduced salivary flow, inflammation of the oral tissues, and increased susceptibility to infections [24]. Additionally, the weakening of the immune system during cancer therapy can impair the body's ability to fight off oral diseases, accelerating the progression of conditions like periodontitis and dental decay. Usage different cycles of chemotherapy in cancer patients in our II subgroups suggests that the second group required a

more intensive therapeutic approach, possibly due to disease severity, tumor characteristics, or treatment response. Additionally, the incidence of radiation therapy and preventive treatments was considerably higher in the second group, indicating a greater emphasis on reducing recurrence risks and improving long-term prognosis.

As a result, patients undergoing cancer treatment are at a considerably higher risk of losing teeth, not only due to direct side effects of the therapy but also because of secondary complications that arise from a weakened oral environment [25]. This highlights the importance of proactive dental care and specialized interventions to mitigate the negative impact of cancer treatments on oral health.

Conclusion. The present study reveals a clear association between covid-19 infection and an increased incidence of teeth loss in patients undergoing cancer treatment. The findings demonstrate that the combined impact of immunosuppression from cancer therapy and the systemic effects of covid-19 significantly compromises oral health, making cancer patients more susceptible to severe dental deterioration that highlights the importance of proactive dental monitoring and early intervention strategies in this vulnerable population [26]. Moreover, the role of booster vaccinations may offer a protective effect, not only against severe covid-19 symptoms but also by indirectly supporting better oral outcomes. Future research should explore tailored oral health protocols to minimize complications and improve the quality of life in cancer patients recovering from covid-19.

Although covid-19 can be transmitted and affect healthy individuals, the rate of teeth loss in those with no underlying health issues and fewer than 10 lost teeth is relatively low. However, a noticeable difference is seen in cancer patients, where teeth loss occurs at a significantly higher rate. This increase is even more pronounced in individuals who are both battling cancer and have contracted covid-19. The difference proves the combination effects of cancer and covid-19, particularly in terms of their impact on the immune system and overall health and underlines the risk of teeth loss compared to those who only have one of these conditions. Among the patients with good and effective oral hygiene teeth lost is considerably reduced.

Several factors impact similarity of experiencing teeth loss in cancer patients take into account their age, the quality of oral hygiene, and the presence of covid-19. As individuals aging, risk of teeth loss increase, partly due to the progression of oral health problems and the cumulative effects of other health conditions. Additionally, poor oral hygiene significantly contributes to the development of gum disease and teeth decay, which can further demonstrate the risk of losing teeth. Furthermore, the impact of covid-19, particularly in immunocompromised patients, can increase susceptibility to oral health complications, leading to increased teeth loss.

The risk of teeth loss is notably higher in individuals who are both cancer patients and have contracted covid-19, as the combination of these two factors seems to express oral health issues. Additionally, individuals diagnosed with cancer alone are also at an increased risk of losing teeth compared to the general population. On the other hand, individuals within the age range of 51 to 60 years experience a reduced risk of teeth loss, suggesting that this age group may have some degree of protection. Furthermore, maintaining a high standard of oral hygiene can lower the likelihood of teeth loss. The use of mild covid-19 vaccines and receiving booster doses also seem to offer some protective benefits, potentially reducing the severity of symptoms and their negative effects on oral health. Proper dental care, including regular brushing, flossing, and professional check-ups, plays a crucial role in preventing tooth decay, gum disease, and other oral health issues that can lead to teeth loss. By consistently practicing good oral hygiene, individuals can lower their risk of severe dental problems, even in the presence of other health challenges.

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THE RISK ASSESSMENT OF TEETH LOSS IN CANCER PATIENTS AFTER COVID-19

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SUMMARY

Maintaining oral health is vital for the overall well-being of immunocompromised individuals, particularly those undergoing chemotherapy or radiotherapy, as these treatments can significantly impact the condition of the oral cavity. Dental care and regular follow-ups are vital at every stage of cancer therapy - before, during, and after treatment - to prevent and manage both immediate and long-term complications. By ensuring comprehensive dental monitoring and intervention, the adverse effects of cancer treatment on oral health can be minimized, helping to stabilize the patient's quality of life throughout their treatment.

The objective of our research is to evaluate the extent of teeth loss in cancer patients who have contracted covid-19.

Materials and methods. The study involved 213 individuals grouped into healthy and cancer patients, with and without covid-19. In the initial phase of the study, we focused on examining how frequently patients lost more than 10 teeth, taking into account their specific health conditions.

Results. The study revealed a significant increase in tooth loss among cancer patients, particularly those who had also contracted covid-19. Statistical analysis showed that individuals in above mentioned two groups were markedly more likely to have lost more than 10 teeth compared to healthy individuals or those with covid-19 alone. Older age (especially over 50), poor oral hygiene, and diabetes were also associated with greater tooth loss. Conversely, receiving a covid-19 booster dose and maintaining good oral hygiene were linked to a reduced risk. Chemotherapy, radiation, and extended treatment cycles significantly contributed to dental deterioration, underscoring the compounding effect of cancer therapies on oral health. Regression analysis confirmed cancer, covid-19, and advanced age as strong predictors of extensive tooth loss, highlighting the need for targeted dental interventions in vulnerable populations.

Conclusion. Proper dental care, including regular brushing, flossing, and professional check-ups, plays a crucial role in preventing tooth decay, gum disease, and other oral health issues that can lead to teeth lost. The use of covid-19 vaccines also seems to offer some protective benefits, potentially reducing the severity of symptoms and their negative effects on oral health.

Keywords: Teeth lost, Post Covid-19, Cancer Patients, and Booster Dose

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