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Telehealth after one year of Breast Cancer Surgery as a Physical Therapy Follow-up Strategy

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ABSTRACT

Introduction: Breast cancer is the most prevalent type of invasive cancer in the female population. The surgical procedure is one of the aspects of oncological treatment. However, there are several postoperative complications resulting from this process, in which physical therapists work from prevention to treatment. During the COVID-19 pandemic, the physical therapy service implemented teleconsultations for the six-month and one-year postoperative follow-ups. The purpose of this article was to evaluate the prevalence of complications identified in physical therapy follow-up, through teleconsultation, and to describe the frequency of face-to-face evaluations to confirm the physical therapy diagnosis. **Methods:** This is a cross-sectional study, including patients submitted to surgical treatment of breast cancer, from January 2019 to September 2021, and who were seen at the one-year postoperative teleconsultation. **Results:** We included 362 patients, with a mean age of 58.17 (±12.16) years. Among the reported complications, the most frequent was paresthesia in the intercostobrachial nerve (87.1%); 23.8% of the patients reported pain; and 22.1%, phantom breast sensation. 11.9% (n=43) of the patients were referred for face-to-face evaluation, being 58.1% (n=25) due to the perception of lymphedema as the main reason for these referrals. **Conclusions:** The most frequent complications reported by patients in one-year teleconsultation were paresthesia, followed by pain and sensation of phantom breast. The greatest reason for referrals to face-to-face consultation was lymphedema. With such findings, this modality of care shows a possibility of effective follow-up in the postoperative period of breast cancer.

KEYWORDS: teleconsultation; breast cancer; physical therapy.

INTRODUCTION

According to the Brazilian National Cancer Institute (*Instituto Nacional de Câncer* – INCA), there are, for each year of the triennium 2023–2025, 73,610 thousand new estimated cases of breast cancer in Brazil, this being the most frequent type of invasive cancer in the female population[1]. The surgical procedure consists of the pillar of oncological treatment for breast cancer, and among the various complications resulting from this process are pain, sensitivity change, reduced range of motion (ROM), scar complications, sensation and pain in the phantom breast, axillary web syndrome (AWS), and lymphedema in the homolateral upper limb (HUL) in relation to surgical treatment. The physical therapist intervenes in the prevention, early detection, and treatment of these complications[2].

Researchers reinforce that the guidelines for the practice of free active movement and strengthening of the upper limbs are indispensable for kinetic-functional recovery and pain control after oncological breast surgery[3-6]. In addition, early postoperative physical therapy with exercises for the shoulder joint showed both pain reduction and improvement of ROM, and recovery of upper limb functionality for daily and labor activities[7].

Social distancing, in early 2020, was recommended due to the advance of the SARS-CoV-2 virus pandemic, in such a way it was necessary to reduce face-to-face consultations and care[8]. In order to guide healthcare professionals, the Brazilian Federal Council of Physical Therapy and Occupational Therapy (*Conselho Federal de Fisioterapia e Terapia Ocupacional* – COFFITO), through Resolution 516 of March 20, 2020, allowed the online care provided in the modalities of teleconsultation, teleconsulting, and telemonitoring by physical therapists and occupational therapists[9].

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According to Federal Law No. 14,510/2022, which authorizes the practice of telehealth throughout the Brazilian territory, telehealth consists in the provision of distance healthcare services, using communication technologies through texts, sounds, and/or images for health information, and ensures that every healthcare professional has the autonomy to decide whether or not to use telehealth whenever deemed necessary[10].

The physical therapy service of the Hospital do Câncer III [Cancer Hospital III] of the Instituto Nacional de Câncer (HC III/INCA), a hospital unit specialized in the treatment of breast cancer, has established in its routine the following physical therapeutic evaluations: first time (before starting the oncological treatment), on the first day, in 30 days, six months, and one year after surgery[11]. The physical therapy consultation of one year after breast cancer surgery is the time to evaluate the possibility of discharge of outpatient physical therapy follow-up in HC III/INCA.

In the initial period of the COVID-19 pandemic, the physical therapy service implemented the practice of telehealth, and consultations of 30 days, six months, and one year after the surgery were carried out in the form of teleconsultation. If face-to-face care was necessary, the recommendations of the Brazilian Association of Physical Therapy in Oncology (*Associação Brasileira de Fisioterapia em Oncologia* – ABFO) for prevention and biosafety against the spread of SARS-CoV-2 were followed[12]. With the control of the pandemic and the return of face-to-face care, the teleconsultation was maintained for the follow-ups of six months and one year after surgery because it allows more comfort and economy to patients[13].

In this study, our objective was to describe the prevalence of complications evaluated in physical therapy follow-up through one-year post-operative teleconsultation of breast cancer and to analyze the frequency and need for face-to-face evaluations to confirm the physical therapy diagnosis.

METHODS

This is a cross-sectional study with patients submitted to surgical treatment of breast cancer in HCIII/INCA, from January 2019 to September 2021, and who were seen via teleconsultation for evaluation and physical therapy follow-up in the one-year postoperative period.

The eligible patients were preselected through active search of the evolutions of consultations in the Care Control System of the Physical Therapy Service (*Sistema de Controle do Atendimento do Serviço de Fisioterapia* – SISCASF). Sociodemographic, clinical, and treatment data were collected from paper and electronic medical records. In addition, the following data were collected from: the physical therapeutic evolution record of the one-year postoperative teleconsultation, the postoperative complications reported, such as pain, sensation and/or pain in the phantom breast, paresthesia in the cutaneous region innervated by the intercostobrachial nerve (ICBN), intercostobrachial neuralgia (ICB), axillary web syndrome (AWS), reduced range of motion (ROM), subjective sensation of lymphedema (sensation of weight and swelling), and lymphedema (patients' perception of change in the volume of HUL).

To evaluate life habits, information regarding personal care and household chores were collected from the physical therapeutic evaluation form, classified as fully carried out, partially or not carried out, practice of home exercises with upper limbs (UL) and the frequency of these exercises, classified as regular, irregular, or not performing it, and practice of leisure physical exercises.

For certain types of complaints reported in teleconsultation, such as lymphedema in HUL, severe pain, reduced ROM, and AWS, the patient was referred to face-to-face consultation. The reason for referral to face-to-face evaluation was collected from physical therapeutic evolutions.

Of the patients referred to face-to-face evaluation, the same complications evaluated in the teleconsultation were collected, and the assessment of lymphedema was verified through perimetry of the upper limbs. Lymphedema was considered when the difference between HUL and the contralateral upper limb was ≥2.0 cm in at least one reference point.

To evaluate the perimetry of the UL, a tape measure was used and the circumference of the limb was measured at six specific points, demarcating the first point in the region of the lateral epicondyle and the others every 7-cm distance to the arm and forearm.

Descriptive analyses of measures of central tendency and dispersion were performed for continuous variables and absolute frequency for categorical variables. The Statistical Package for Social Sciences (SPSS), version 21.0, was used for data analysis.

This study was approved by the Research Ethics Committee (*Comitê de Ética e Pesquisa* – CEP) of INCA under number 4.702.209.

RESULTS

We included 362 patients, with a mean age of 58.17 (±12.16) years. Most were women (98.9%), self-reported to be Black and/or mixed-race (63.0%), did not live with a partner (57.7%), had level of education equal to or greater than eight years of formal education (69.0%), had household chores as the main occupation (69.3%), and resided in the "Metropolitana I" region of the state of Rio de Janeiro (RJ), Brazil (91.4%)[14] (Table 1).

At the time of breast cancer diagnosis, 73.7% of patients were classified with locally advanced clinical staging (≥IIB), but at the time of one-year postoperative teleconsultation, only 2.8% presented disease progression. Regarding surgical treatment, 82.3% of the patients underwent mastectomy and 88.1% underwent axillary lymphadenectomy. Only 3.1% of women submitted to mastectomy underwent immediate breast reconstruction with silicone prosthesis or tissue expander. Most were submitted to chemotherapy (89.0%), radiotherapy (88.7%), and hormone therapy (86.7%); and only 15.8%, to molecularly targeted therapy (Table 1).

At the time of the one-year teleconsultation, 82.3% of the patients were under treatment with hormone therapy; 3.0%,

radiotherapy; 3.0%, chemotherapy; and 4.1%, molecularly targeted therapy (Table 2).

Among the complications reported in the one-year physical therapy teleconsultation, the most frequent was paresthesia in the ICBN (87.1%); 23.8% of the patients reported pain and 22.1%, phantom breast sensation. The subjective sensation of lymphedema was reported by 4.1% of the patients and 6.9% noticed changes in the volume of HUL, characterizing lymphedema (Table 3).

As for life habits, most patients reported to be independent for personal care (99.7%), of which 79.3% carried out household chores alone, without assistance. Home exercises with upper limbs (UL), according to postoperative guidelines, were present in 83.1% of the population, with regular frequency of 50.1%. As for physical exercises, only 28.7% of the patients practiced them (Table 4).

During the teleconsultation, 43 women (11.9%) were referred to face-to-face evaluation at the HCIII/INCA physical therapy outpatient clinic (non-tabulated data). Regarding the reason for referral, 58.1% (n=25) reported lymphedema, due to the perception of alteration in the volume of HUL. Other complications confirmed in the face-to-face evaluation are shown in Table 5.

Table 1. Sociodemographic, clinical, and treatment data of the study population (n=362).

Variables	n (%)[a]	Variables	n (%)
Age (mean and SD)	58.17 (±12.16)	**Disease progression***	
		No	352 (97.2)
		Local recurrence	3 (0.8)
		Distant metastasis	7 (2.0)
Sex		**Breast surgery**	
Women	358 (98.9)	Conservative	63 (17.4)
Men	4 (1.1)	Mastectomy	298 (82.3)
		No approach**	1 (0.3)
Skin color		**Axillary approach**	
Black and/or mixed-race	228 (63.0)	SLNB	43 (11.9)
White	134 (37.0)	AL	319 (88.1)
Marital status		**Immediate breast reconstruction*** **	
Have a partner	153 (42.3)	No	285 (96.9)
No partner	209 (57.7)	Yes	9 (3.1)
Level of education*		**Chemotherapy**	
<8 years	110 (31.0)	No	40 (11.0)
≥8 years	247 (69.0)	Yes	322 (89.0)
Occupation		**Radiotherapy**	
Housewife	251 (69.3)	No	41 (11.3)
Outside job	111 (30.7)	Yes	321 (88.7)
Residence region (RJ)			
Metropolitana I	331 (91.4)	**Hormone therapy**	
Metropolitana II	19 (5.2)	No	48 (13.3)
Serrana	7 (2.0)	Yes	314 (86.7)
Baixada litorânea	4 (1.1)		
Médio Paraíba	1 (0.3)		
Clinical staging		**Targeted therapy**	
0-IIA	95 (26.3)	No	305 (84.2)
≥IIB	266 (73.7)	Yes	57 (15.8)

SD: standard deviation; SLNB: sentinel lymph node biopsy; AL: axillary lymphadenectomy; RJ: Rio de Janeiro. *Patients who were under treatment due to progression of the disease at the time of the one-year teleconsultation; **exclusive axillary lymphadenectomy, without breast approach, for occult breast cancer; ***the difference in the total sample is due to the total number of women undergoing mastectomy; [a]the total value may change due to missing values.

DISCUSSION

In this study, we identified that the main symptom reported by patients in the one-year teleconsultation after breast cancer surgery is paresthesia in the ICBN (87.1%), characterized by alteration of sensitivity in the medial region of the arm, axilla, and lateral trunk resulting from nerve injury[15,16].

As ICBN has close connection with axillary lymph nodes, the risk of injury is high during lymph node dissection[16]. The diagnosis of ICBN injury is clinical and, although numbness is very common, several events may occur in the distribution of the nerve due to changes in its function, such as tingling, burning and electrical sensations, in addition to pain[15,16].

According to Andersen *et al.*[17], hypoesthesia was the main sensory dysfunction one year after surgery, affecting 85.0% of patients. The authors also sought a relationship between surgical treatment and sensory dysfunction, and observed that the areas of hypoesthesia were significantly greater for patients treated with mastectomy ($p<0.0001$) and axillary lymphadenectomy (AL; $p<0.0001$) compared to those treated with conservative surgery and sentinel lymph node biopsy (SLNB).

Table 2. Treatment in progress at the time of the one-year teleconsultation after breast cancer surgery (n=362).

Variables	n (%)*
Treatment in progress	
No	52 (14.4)
Adjuvant	300 (82.9)
Palliative	10 (2.8)
Hormone therapy	
No	64 (17.7)
Yes	298 (82.3)
Chemotherapy	
No	351 (97.0)
Yes	11 (3.0)
Radiotherapy	
No	351 (97.0)
Yes	11 (3.0)
Targeted therapy	
No	347 (95.9)
Yes	15 (4.1)

*The same patient could be undergoing more than one treatment simultaneously, except in cases of chemotherapy and hormone therapy or chemotherapy and radiotherapy.

Lucena *et al.*[18] carried out a cross-sectional cohort in the same institution of the present study and evaluated 182 women after one year of surgical treatment for breast cancer; they observed that 58.2% of the interviewees reported paresthesia in the ICBN. However, in the aforementioned study, the majority of patients only underwent SLNB (58.2%), while in our study the vast majority were submitted to AL (88.1%).

In the study by Siqueira *et al.*[19], 47.2% of the interviewees reported sensory alteration related to ICBN injury after the mean time of 5.06 years (±1.8) between surgery and evaluation. The difference in the results can be justified by the fact that the evaluation of patients in the research of Siqueira *et al.*[19] was carried out in a longer interval, in addition to a higher percentage of SLNB (39.8%), compared to the present study.

Persistent pain or painful syndrome after treatment of breast cancer related to intercostobrachial neuralgia (pain in the ICBN) or in the phantom breast is another common symptom, affecting 25–60% of patients, and has been associated with a decrease in quality of life.

In addition to surgery, adjuvant therapies, such as radiotherapy and systemic treatments, are also risk factors for painful syndrome, as they can cause damage to nerve fibers[20-22].

In the study sample, 23.8% of the patients complained of pain at the time of the physical therapy teleconsultation, most related to the upper limb homolateral to surgery (14.4%). Pain was the second most frequent reason (41.8%) for referral of patients to face-to-face outpatient consultation.

Authors of a meta-analysis comprised of 18 observational studies with 6,364 patients with persistent pain after breast cancer surgery found that the prevalence of this symptom was 31.0% (95%CI: 23–41%) in 1–2 years[23].

The complication responsible for the highest number of referrals to face-to-face consultation after one year of surgery

Table 3. Complications reported in the one-year teleconsultation after breast cancer surgery (n=362).

Variables	n (%)*[a]
Paresthesia in the ICBN	
No	47 (12.9)
Yes	312 (87.1)
ICB	
No	347 (96.9)
Yes	11 (3.1)
AWS	
No	357 (98.6)
Yes	5 (1.4)
ROM	
No	359 (99.2)
Yes	3 (0.8)
Pain	
No	276 (76.2)
Yes	86 (23.8)
Pain site	
HUL	52 (14.4)
Chest wall/breast/thorax	17 (4.7)
Other	17 (4.7)
Does not apply	276 (76.2)
Phantom breast	
No	198 (56.9)
Yes	77 (22.1)
Does not apply**	73 (21.0)
Subjective sensation of lymphedema	
No	347 (95.9)
Yes	15 (4.1)
Lymphedema	
No	337 (93.1)
Yes	25 (6.9)

ICBN: intercostobrachial nerve; ICB: intercostobrachial neuralgia; AWS: axillary web syndrome; ROM: reduced range of motion; HUL: homolateral upper limb. *Each patient may have presented more than one complication; **women undergoing conservative surgery and immediate breast reconstruction; [a]the total value may change due to missing values.

Table 4. Life habits and home routine at the time of the one-year teleconsultation after breast cancer surgery (n=362).

Variables	n (%)[a]
Independence in personal care	
Yes	361 (99.7)
No	1 (0.3)
Household chores	
Carries it out completely	287 (79.3)
Carries it out partially	73 (20.2)
Does not carry it out	2 (0.6)
Practice of home exercises with UL	
Yes	301 (83.1)
No	61 (16.9)
Frequency of home exercises with UL	
Regular*	181 (50.0)
Irregular	120 (33.1)
Never	61 (16.9)
Practice of physical exercises	
Yes	100 (28.7)
No	248 (71.3)

UL: upper limbs. *At least once a day; [a]the total value may change due to missing values.

Table 5. Complications confirmed in the face-to-face consultation (43 women).

Variables	n (%)*
Lymphedema	25 (58.1)
Pain	18 (41.8)
Paresthesia in the ICBN	2 (4.6)
AWS	1 (2.3)
ROM	1 (2.3)

ICBN: intercostobrachial nerve; AWS: axillary web syndrome; ROM: reduced range of motion. *Each patient may have presented more than one complication.

was lymphedema, reported by 25 women (6.9% of the sample), through the perception of alteration in the volume of HUL. This prevalence was confirmed in the face-to-face evaluation.

According to recent research, the incidence of lymphedema after surgical treatment of breast cancer varies according to the characteristics of the studied population, being associated, in general, with high body mass index/obesity, a higher number of lymph nodes removed, radiotherapy on the lymph node chain, and taxane-based chemotherapy[24-26].

In the study by Furlan *et al.*[27], whose objective was to evaluate the circumference and the sensation of swelling in the upper limb homolateral to surgery right after the procedure and within 24 months, the authors identified that, in the first year, of the 152 patients followed up, 23.7% had a feeling of limb edema; 21.1% had a difference greater than 2 cm at a single point; and 5.9%, circumference greater than 2 cm at two points, comparing the affected limb and contralateral limb.

In the present study, in the one-year teleconsultation, only 4.1% of patients reported a subjective sensation of lymphedema and 6.9% (n=25) reported lymphedema because they noticed changes in the volume of the affected limb, which was confirmed in all of these 25 patients in the face-to-face evaluation.

Konish *et al.*[28] found cumulative incidence of lymphedema in high-risk patients of approximately 3.0% in one year. Conversely, in the study by Paramanandam *et al.*[29], of the 149 patients guided as for the usual care with arm, skin, drain, and daily shoulder exercises since the first postoperative day, the cumulative incidence in one year was 25.0%. When evaluating 580 patients submitted to breast surgery and postoperative radiotherapy with or without systemic treatment, Kim *et al.*[30] found a cumulative incidence of 10.5% after one year of radiotherapy, but in this sample the majority of patients (84.5%) underwent conservative breast surgery and sentinel lymph node biopsy (78.4%), and less than half of the patients (37.4%) did not receive chemotherapy.

In the cohort study conducted by Fabro *et al.*[31], on 174 women with a mean age of 58 years, 29.5% of the patients reported the subjective sensation of edema in the upper limb homolateral to surgery after approximately eight months postoperatively, corroborating our findings, although the evaluation time was slightly shorter in the aforementioned study[31].

ICBN paresthesia and lymphedema were also the most common complications found in the study conducted by Abass *et al.*[32] In a sample of 96 patients, the authors identified paresthesia as the most frequent complication (21.9%), followed by lymphedema (9.4%), in the average time of 18 months of follow-up.

Although most patients in the present study reported total independence for personal care (99.7%) and carrying out household chores, without assistance (79.3%), demonstrating being active in the day-to-day, when questioned about the practice of exercises with the UL, 83.1% stated practicing them as recommended since the physical therapy consultation of the first postoperative day, but half of these (50.0%) followed a regular routine (at least once a day). Only 28.7% of the interviewees reported practicing some kind of sport activity at the time of teleconsultation.

Marchito *et al.*[33] also observed that patients submitted to surgical treatment of breast cancer adhere to the preventive physical therapy guidelines (skin care and exercise with UL) after surgery, especially in the early months, and that adherence to these guidelines reduced in the following months, mainly due to household chores.

Lee *et al.*[34], in a study carried out in Malaysia on the practice of global physical activity by breast cancer survivors, found that physical activity levels in this population were inadequate since diagnosis and that they significantly reduced (p=0.04) over three years after cancer discovery. Among the interviewees, 48.1% were active at the time of diagnosis, 39.8% in one year, and 35.3% in the third year.

Groef *et al.*[35] assessed the levels of global physical activity within two years after breast cancer surgery and found that in none of the domains (occupational, sports, and domestic) there was a return to preoperative activity levels.

The studies whose authors address teleconsultation as a modality of care show that this strategy is effective, accessible, and viable for monitoring patients in breast cancer treatment. Singleton *et al.*[36] suggested that interventions through teleconsultation had wide range, high acceptance by survivors of breast cancer, and were effective in improving quality of life, self-efficacy, fatigue, and psychological suffering.

Nápoles *et al.*[37] found positive evidence related to viability, acceptability, and efficacy, with significant improvement in fatigue, psychological suffering, and emotional well-being as well as benefits related to greater knowledge of recommended care. The authors also observed an improvement in symptoms and in the level of physical activity in breast cancer survivors. Macedo *et al.*[13] evaluated patients' opinion on teleconsultations for follow-up of breast cancer, and showed good acceptance with patients feeling safe, satisfied, and comfortable.

A recent guideline on telerehabilitation in patients with breast cancer suggests that this modality is present from the initial moments of the preoperative period and through individualized programs, with prescription of exercises in the postoperative and at the long term[38]. Moreover, authors of systematic reviews have shown that this form of care is cost-effective in public health, especially for people living in rural areas[39,40].

Although this is a cross-sectional study, with no information since the preoperative period, its strength is presenting the prevalence of the main complications one year after breast cancer surgery evaluated through teleconsultation. The predominant symptoms or complications described in this period may guide physical therapists and other healthcare professionals in their medium- and long-term conduct. In addition, we showed that the number of face-to-face consultations required after teleconsultation was low, which makes the online modality a viable resource after surgical treatment of breast cancer.

CONCLUSIONS

The most frequent complications reported by patients in the one-year teleconsultation after breast surgery were paresthesia, pain, and phantom breast sensation. The greatest reason for referrals to face-to-face consultation was lymphedema, with diagnostic confirmation of all cases. With such findings, this modality of care shows a possibility of effective follow-up in the postoperative period of breast cancer.

AUTHORS' CONTRIBUTION

JFC: Data curation, Formal analysis, Investigation, Methodology, Writing – original draft. FOM: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. EANF: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. FOF: Data curation, Investigation, Writing – original draft, Writing – review & editing. DMT: Data curation, Investigation, Writing – original draft, Writing – review & editing. JFOTO: Data curation, Investigation, Writing – review & editing. SAS: Data curation, Investigation, Writing – review & editing. RMC: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing.

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