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Physiotherapy Management in Postpartum Caesarean Section Patients with Leg Edema and Mobility Limitations: A Case Report

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Abstract: The rate of delivery through Sectio Caesarea (SC) continues to increase globally and is often followed by postoperative problems such as incision pain, lower extremity oedema, impaired mobility, and difficulties in early lactation. These conditions may delay postpartum recovery and reduce maternal functional independence. Comprehensive physiotherapy intervention is therefore important to support early recovery after SC. **Objective:** This case report aimed to describe the outcomes of a comprehensive physiotherapy management program in a post-SC patient with lower extremity oedema and functional mobility limitation. **Methodology:** This study used a case report design involving a 28-year-old primigravida woman who underwent SC due to post-term pregnancy and cephalopelvic disproportion. Clinical data were collected through physiotherapy assessment, direct observation, and follow-up evaluation during 72 hours of hospitalization. The intervention program was arranged using the FITT principle and included deep breathing exercise, static contraction, ankle pumping exercise, leg elevation, early mobilization, breast massage, and oxytocin massage. Outcomes were evaluated using the Numeric Rating Scale, figure-of-eight method, clinical mobility observation, lactation status, and Barthel Index. **Findings:** After intervention, movement pain decreased from NRS 6/10 to 1/10, while the Barthel Index improved from 15, indicating total dependence, to 65, indicating moderate dependence. The patient was able to perform transfers and walk 5–10 meters with supervision. Lactation also improved gradually. However, changes in lower extremity oedema were minimal during the observation period. **Implication:** This case suggests that early and structured physiotherapy management may support pain reduction, mobility improvement, functional independence, and lactation support after SC. **Originality:** This report provides an integrated description of physiotherapy management for multiple early postpartum problems during short-term inpatient rehabilitation.

Keywords: Early Mobilization; Leg Oedema; Physiotherapy; Postoperative Pain; Sectio Caesarea.

INTRODUCTION

Caesarean section (CS) is one of the most common obstetric surgical procedures and continues to increase globally. The World Health Organization reported that worldwide CS rates rose from approximately 7% in 1990 to around 21% in recent years, and this trend is projected to continue increasing in the next decade (World Health, 2021) In Indonesia, the

prevalence of CS delivery has also increased, from 17.6% based on Riskesdas 2018 to 25.9% according to the 2023 Indonesia Health Survey report (Adha et al., 2025). Although CS is a life-saving procedure when performed for appropriate medical indications, such as post-term pregnancy and cephalopelvic disproportion (CPD), it may also result in several post-operative problems. These include incision pain, fear of movement, reduced functional mobility, venous circulation disturbance, lower limb edema, and delayed initiation of breastfeeding. Therefore, post-CS recovery should not only focus on wound healing, but also on early functional restoration and maternal independence.

Previous studies on post-CS rehabilitation can be grouped into three major categories. The first group focuses on pain and early mobilization, showing that post-operative pain may reduce the mother's willingness to move and delay recovery, while structured mobilization may help improve functional ability and shorten the recovery period (Sulistiawati et al., 2024; Tazreean et al., 2022; Weerasinghe et al., 2022). The second group discusses lower limb edema and circulatory management, particularly the role of ankle pumping exercises, limb elevation, and pelvic or lower extremity exercises in improving venous return and reducing fluid accumulation (Damayanti et al., 2024; Devi & Widodo, 2022; Khoiron Nisa et al., 2024; Shelat et al., 2026). The third group addresses maternal role recovery and lactation support, emphasizing that postpartum physical comfort, psychological adaptation, and breastfeeding assistance are important factors in supporting maternal bonding and postpartum quality of life (Qoyimah, 2021; Rohmaniah et al., 2023; Rustini & Tridiyawati, 2022). However, most previous studies tend to discuss these problems separately, such as pain, mobility, edema, or lactation, while only a limited number of reports describe integrated physiotherapy management in a post-CS patient who experiences these problems simultaneously during the early inpatient period.

Based on this gap, this case report aims to describe the physiotherapy management of a postpartum patient following Caesarean section who presented with abdominal incision pain, bilateral lower limb edema, limited functional mobility, and delayed onset of breast milk production. The intervention program was arranged using the FITT principle, consisting of deep breathing exercise, static contraction, ankle pumping exercise, leg elevation, early mobilization, breast massage, and oxytocin massage. The outcomes were evaluated using the Numeric Rating Scale (NRS), Manual Muscle Testing (MMT), the figure-of-eight method for edema measurement, clinical mobility observation, lactation status, and the Barthel Index. By presenting these clinical findings, this case report is

expected to contribute to evidence-based physiotherapy practice in early post-CS rehabilitation.

This case report argues that early, structured, and comprehensive physiotherapy management may support the recovery process in post-CS patients by reducing pain, improving functional mobility, supporting venous return, and facilitating maternal role reintegration. In this case, the combination of breathing exercises, gentle muscle activation, ankle pumping, limb elevation, progressive mobilization, and lactation-related massage was expected to improve early postpartum functional outcomes. Nevertheless, because this is a single-patient case report with a short observation period, the clinical improvement should be interpreted cautiously and cannot be used to establish a direct causal relationship. The findings mainly serve as preliminary clinical evidence that integrated physiotherapy intervention may be beneficial in supporting early recovery after Caesarean section.

CASE PRESENTATION

Patient Information

The patient is a 28-year-old woman who is currently in the post-operative recovery care period following a Caesarean Section (CS). The patient's current obstetric status is G1P1A0 (primipara, live birth). The CS surgery was performed due to a medical indication of post-term pregnancy (41 weeks) accompanied by Complicated Cephalopelvic Disproportion (CPD). The patient's main complaints post-operation are acute pain at the abdominal incision wound, swelling in both lower extremities, limited mobility, and delayed onset of milk production.

Clinical Timeline

To facilitate understanding of the patient's clinical development during physiotherapy interventions, the following patient evaluation timeline is presented:

Table 1. Clinical Timeline of Patient Development

Evaluation Time	Clinical Condition	Main Intervention	Outcome
T1 (0–24 hours post-C-section)	Movement pain NRS 6/10, bilateral edema grade 1, bed rest, breast milk has not come out yet	Deep breathing exercise, static contraction, ankle pumping, leg elevation	The patient has started to tolerate light exercise

Evaluation Time	Clinical Condition	Main Intervention	Outcome
T2 (24–48 hours post-C-section)	Pain decreased, able to sit at the edge of the bed, edema relatively stable with minimal reduction	Progressive mobilization, transfer training, lactation stimulation	The patient is able to sit steadily, breast milk begins to flow after being stimulated through massage
T3 (48–72 hours post-C-section)	Minimal pain, able to transfer and walk 5–10 meters	Ambulation exercises, light strengthening, advanced lactation	Mobility increases, breastfeeding flows smoothly, functional independence improves

Physical Examination

Objective examination showed the patient's vital signs within normal limits. Inspection and palpation confirmed the presence of grade 1 pitting edema in both lower extremities. Measurement of the distal circumference of the lower extremities using the figure of eight method showed the following results.

Table 2. Anthropometric Measurement Results (Edema) Using the Figure of Eight Method

Lower Extremity Region	Measurement Results
Dextra (right)	54 cm
Sinistra (left)	54,5

Because the patient must undergo bed rest post-surgery, this triggers a decrease in lower extremity muscle activation. Muscle strength examination was conducted using Manual Muscle Testing (MMT), which indicated mild weakness in the leg muscles because the patient is still restraining movement to avoid pain (score 3/5, able to move against gravity but not yet maximally against resistance).

Table 3. Muscle Strength Examination Results (MMT 0-5)

Lower Limb Muscle Groups	Dextra (Right)	Sinistra (Left)
Hip Flexor	3	3
Hip Extensor	3	3
Knee Flexor	3	3
Knee Extensor	3	3
Ankle Dorsiflexor	3	3
Ankle Plantarflexor	3	3

For pain assessment using the Numeric Rating Scale (NRS) it showed resting pain 2/10, pressure pain 4/10, and movement pain (when turning/getting up) 6/10. The patient's functional ability is still assessed in the total dependency category.

Table 4. Functional Examination Results (Barthel Index)

Activity Indicators	Score	Description
Feeding (Eating)	5	Needs partial assistance
Bathing	0	Relying completely on others
Grooming (Self-Care)	0	Needs help with personal care
Dressing	0	Completely dependent on aid
Bowels	10	Controlled (Continence)
Bladder	0	Urinary catheter installed post-operation
Toilet Use	0	Fully dependent on a chamber pot/catheter
Transfers (Changing Positions)	0	Not yet able to get out of bed/bed rest
Mobility (Walking on Flat Surfaces)	0	Immobilization (unable to walk)
Stairs (Going Up and Down Stairs)	0	Not yet able
TOTAL SKOR (0-100)	15	Total Dependence

Interpretation of results:

0-20: Total dependence.

21-60: Heavy dependence.

61-90: Moderate dependence.

91-99: Light/slight dependence.

100: Fully independent.

Before mobilization is carried out, the patient first undergoes a Homan's Sign examination to identify the potential risk of Deep Vein Thrombosis (DVT), and the result is negative. Nevertheless, this result is only used as an initial screening stage. The determination that early mobilization can be safely performed is still based on a comprehensive evaluation of the patient's clinical condition, including stable vital signs, no excessive calf pain complaints, no asymmetrical limb swelling, and coordination with the healthcare personnel handling the patient.

Diagnostic Assessment

The physiotherapy diagnosis in the patient was established as a functional mobility disorder after a Caesarean section (C-section) surgery, related to limited movement due to pain in the abdominal incision area with a pain scale of NRS 6/10 during movement. This condition is also accompanied by fluid accumulation in the form of grade 1 pitting edema in both ankles, lower limb muscle weakness due to bed rest, and worsened by problems in the lactation process.

Intervention

To improve the systematic approach of interventions, all physiotherapy programs are arranged within the framework of the FITT principles (Frequency, Intensity, Time, Type) complemented with objectives, progression, and success indicators as follows:

Table 5. FITT-Based Physiotherapy Intervention Program

Intervention	Frequency	Intensity	Time	Type	Goal	Progression	Success Indicators
Deep Breathing Exercise	2–3 times/day	Light, painless	10–15 minutes	Deep breathing exercise	Reducing pain & relaxation	Increase in duration & breath control	Decrease in NRS
Static Contraction	2–3 times/day	Mild contractions (≤3/10 pain)	10–15 minutes	Abdominal isometric	Wound stability & pain control	Increase in contraction hold duration	Movement pain decreases
Ankle Pumping	2–4 times/day	Active within comfortable limits	10–15 minutes	Dorsiflexion-plantarflexion	Reducing edema	Increase in repetitions/sets	Edema circumference decreased
Leg Elevation	Daily	Comfortable position	10–15 minutes	Leg elevation	Improving venous return	Duration extended	Edema reduced
Early Mobilization	1–2 times/day	Progressive according to tolerance	10–15 minutes	Bed exercise → ambulation	Improving mobility	Sit → stand → walk	Increase in Barthel Index
Breast Massage	2–3 times/day	Soft	5–10 minutes	Breast massage	Stimulation of breast milk production	Frequency reduced when smooth	Breast milk has started to come out
Oxytocin Massage	2–3 times/day	Soft	5–10 minutes	Massage T5–T6	Stimulating the oxytocin reflex	Adjusted to needs	Breast milk flows smoothly

Follow-up and Outcomes

The consistent implementation of the physiotherapy program during the inpatient period shows a tendency for clinical improvement during the observation period. The following is a breakdown of the evaluation results based on the measurement instruments used:

1. Incision Wound Pain Evaluation (Numeric Rating Scale)

Table 6. Pain Evaluation Results (NRS 0-10)

Evaluation Time	Pain Scale (NRS)			Description
	Silent	Press	Move	
T1	2/10	4/10	6/10	Moderate pain, the patient is still on bed rest

Evaluation Time	Pain Scale (NRS)			Description
	Silent	Press	Move	
T2	1/10	3/10	3/10	The pain is becoming increasingly mild, but the patient is starting to tolerate sitting transition movements
T3	0/10	1/10	1/10	There was a decrease in pain intensity (mild pain category); the patient can perform light activities comfortably

2. Evaluation of Lower Extremity Edema (Figure of Eight Method)

Swelling measurement is carried out precisely using a measuring tape through the figure of eight method, which is wrapped crosswise over specific anatomical landmarks: the anterior midpoint of the ankle, navicular tuberosity, base of the fifth metatarsal, medial malleolus, and Achilles tendon.

Table 7. Evaluation Results of Edema (Figure of Eight Method)

Evaluation Time	Right Limb	Left Limb
T1	54 cm	54,5 cm
T2	54 cm	54 cm
T3	54 cm	54 cm

3. Mobility and Lactation Evaluation

Clinical functional evaluation showed significant progress in basic movement independence and recovery of the patient's maternal role.

Table 8. Mobility and Lactation Evaluation Results

Evaluation Time	Achievement of Mobility and Functional Activities	Lactation Status
T1	Status of bed rest. Not yet able to change position	Breast milk hasn't come out yet
T2	Able to change basic positions and sit stably without full assistance	Start giving stimulation massage
T3	Able to change position and walk to the bathroom (5-10 meters) safely	Breast milk flows smoothly; the patient can breastfeed the baby with a good latch

4. Evaluation of Functional Independence (Barthel Index)

The level of patient independence in performing Activities of Daily Living (ADL) is evaluated using the Barthel Index instrument, which includes 10 activity indicators. Scores are assessed based on observation of what the patient is actually able to do.

Table 9. Results of Barthel Index Evaluation (Score 0-100)

Activity Indicators	T1 (Score)	T2 (Score)	T3 (Score)	Description
Feeding (Eating)	5	10	10	From needing help to being independent
Bathing	0	0	0	Still dependent on assistance (lap)
Grooming (Self-Care)	0	5	5	Independent in caring for the face/teeth
Dressing	0	5	5	Still needs partial assistance
Bowels	10	10	10	Controlled (continent)
Bladder	0	10	10	The catheter was removed, controlled
Toilet Use	0	5	5	Still need a little help
Transfers (Changing Position)	0	10	10	Able to sit and move with minor assistance
Mobility (Walking)	0	10	10	Able to walk short distances (5–10 meters) with assistance or supervision
Stairs	0	0	0	Not yet capable/Not yet evaluated
TOTAL INDEPENDENCE SCORE	**15**	**65**	**65**	**Transition from total dependence to moderate dependence**

Interpretation of results:

0-20: Total dependency.

21-60: Heavy dependency.

61-90: Moderate dependency.

91-99: Light/slight dependency.

100: Fully independent.

The evaluation results show the patient's functional transition from total dependence to moderate dependence within 72 hours post-physiotherapy intervention.

DISCUSSION

Physiotherapy management in the post-Caesarean section (C-section) period focuses on recovering the mother's physical capacity so she can independently resume functional activities and maternal roles. In this case report, the patient experienced abdominal incision pain, grade 1 pitting edema in both lower extremities, limited mobility due to bed rest, and early lactation disorders. The physiotherapy program was provided comprehensively through an approach based on the FITT principle (Frequency, Intensity, Time, Type),

which included deep breathing exercises, static contraction, ankle pumping exercises, limb elevation, early mobilization, breast massage, and oxytocin massage.

Pain Management through Deep Breathing Exercise and Static Contraction

The evaluation results showed a decrease in movement pain from NRS 6/10 to 1/10 within 72 hours. This reduction in pain is consistent with the mechanism of deep breathing exercise, which can reduce muscle tension, improve tissue oxygenation, and help decrease sympathetic nervous system activity (Rustini & Tridiyawati, 2022). In addition, deep breathing techniques are also known to stimulate the release of endorphins, thereby helping to reduce pain perception in post-operative patients (Rohmaniah et al., 2023).

Combination with static contraction exercises in the abdominal muscles helps improve the stability of the incision area without putting excessive strain on the surgical wound. This light isometric contraction supports pain control and maintains muscle activation during the early immobilization period (Chotimah & Puspitasari, 2021). Findings in this case are consistent with research by (Chotimah et al., 2025; Sanjaya et al., 2024; Suharti et al., 2025), which states that deep breathing relaxation exercises can help reduce muscle spasms, improve blood vessel vasodilation, and break the pain–anxiety–muscle tension cycle in post-surgical patients.

Nonetheless, the results need to be interpreted carefully because the reduction in pain is likely not only influenced by physiotherapy interventions, but also by the use of analgesics, the natural wound healing process, and the patient's psychological adaptation to post-operative conditions.

Management of Edema through Ankle Pumping Exercise and Limb Elevation

Management of edema in both lower extremities is carried out through ankle pumping exercises and leg elevation during rest. This intervention aims to improve venous return flow and utilize the muscle pump mechanism in the calf muscles to help reduce peripheral fluid accumulation. Dorsiflexion and plantarflexion movements are known to help push extracellular fluid back into the venous circulation, thereby improving peripheral blood circulation (Khoiron Nisa et al., 2024).

The evaluation results showed a minimal decrease in edema, measuring 0.5 cm in the left leg, while the measurement of the right leg remained stable. These findings indicate that although the intervention was provided according to physiological principles, the

clinical effect on edema reduction during the short observation period was not yet optimal. These results are in line with the research by Damayanti which states that ankle pumping exercises are effective in aiding venous circulation, but the reduction of peripheral edema generally requires a longer duration of therapy, especially in post-operative patients with immobilization factors and hemodynamic changes (Damayanti et al., 2024). The elevation of the limb provided simultaneously also helps to facilitate venous and lymphatic drainage with the aid of gravity (Adilla Syahida & Zikran, 2024).

Thus, the interventions of ankle pumping and limb elevation in this case can be said to support the stabilization of the edema condition, although they have not yet shown clinically significant changes in size during the observation period.

Recovery of Mobility through Early Mobilization

Post-CS mobility limitations are often influenced by pain, fear of movement, and the effects of prolonged bed rest. In this case, early mobilization was carried out gradually, starting with bed exercises, sitting on the edge of the bed, position transfers, and walking for 5–10 meters within 72 hours. Prior to the intervention, the patient had undergone a Deep Vein Thrombosis (DVT) risk screening using Homan's Sign, which was negative, so early mobilization was considered safe to perform based on a comprehensive clinical evaluation, even though Homan's Sign itself is not the gold standard for DVT screening.

The increase in patient mobility is demonstrated through the ability to perform transfers independently with minimal assistance, as well as an improvement in the Barthel Index score from 15 to 65, indicating a change from total dependence to moderate dependence. These findings support the research of Bakhtiar and Ambarwati, Imelda & Setiyowati and Harvianti, which states that early mobilization can accelerate the recovery of muscle function, improve blood circulation, speed up surgical wound healing, and help prevent secondary complications such as DVT and tissue adhesions (Bakhtiar & Ambarwati, 2025; Damayanti et al., 2024; Harvianti, 2025).

Although there is an increase in functional ability, the patient's mobility achievement is still at an early stage because ambulation is still limited to short distances with supervision. Therefore, these results indicate early functional improvement, but do not yet reflect full mobility recovery.

Lactation Support and Reintegration of Maternal Role

In addition to musculoskeletal disorders, the patient also experienced initial obstacles in breast milk production. Interventions of breast massage and oxytocin massage were provided to help stimulate the oxytocin hormone and increase the patient's comfort during breastfeeding. Evaluation results showed that breast milk began to flow smoothly on the 2nd day, accompanied by the patient's ability to breastfeed directly with proper attachment.

The success of lactation in this case is likely influenced by several interrelated factors, including reduced pain when sitting, increased mobility, mechanical stimulation through massage, psychological support, as well as the natural physiological processes of the postpartum period. This finding aligns with Qoyimah who stated that the recovery of maternal functional ability is closely related to the success of the bonding process and maternal adaptation during the postpartum period (Qoyimah, 2021). Although showing positive results, the specific contribution of physiotherapy interventions to increased breast milk production cannot be absolutely separated from other factors that also affect the postpartum lactation process.

Study Limitations

This case report has several limitations. First, the number of subjects is only one patient, so the results cannot be generalized. Second, the observation duration is relatively short, around 72 hours, so it cannot yet depict long-term outcomes. Third, the improvement in the patient's condition is likely also influenced by other factors such as the use of analgesics, removal of the urinary catheter, standard medical care, and the natural post-operative recovery process. Additionally, no further follow-up was conducted to evaluate the sustainability of the therapy outcomes.

Ethical Consideration

The patient has been provided with an explanation regarding the purpose, procedure, benefits, as well as the publication of this case report, and has given written informed consent to participate and agree to the publication of case data and examination results anonymously without including the patient's personal identity. All clinical information presented in this report is kept confidential in accordance with the ethical principles of health research. This case report does not require formal ethical clearance because it only reports a single clinical case without experimental interventions and is part of routine

physiotherapy services in accordance with the policies of the relevant healthcare institution. Nevertheless, all procedures are carried out in accordance with the ethical principles of the Declaration of Helsinki.

CONCLUSION

This case report highlights that early and structured physiotherapy management may support the initial recovery process in postpartum patients following Caesarean section. The main clinical finding shows that a comprehensive intervention program consisting of deep breathing exercise, static contraction, ankle pumping exercise, leg elevation, early mobilization, breast massage, and oxytocin massage was associated with reduced incision pain, improved functional mobility, increased independence in daily activities, and better lactation performance within 72 hours of observation. The patient's movement-related pain decreased from NRS 6/10 to 1/10, while the Barthel Index score increased from 15, indicating total dependence, to 65, indicating moderate dependence. These findings suggest that early physiotherapy intervention can help patients gradually regain mobility and maternal functional roles after Caesarean section.

The scientific contribution of this case report lies in its integrated description of physiotherapy management for a post-Caesarean patient with multiple early postpartum problems, including incision pain, bilateral lower limb edema, mobility limitation, and delayed lactation. Unlike reports that focus only on pain control or early mobilization, this case presents a more comprehensive rehabilitation approach using the FITT principle and several clinical outcome measures, such as the Numeric Rating Scale, Manual Muscle Testing, figure-of-eight edema measurement, clinical mobility observation, lactation status, and the Barthel Index. Therefore, this report may provide practical clinical insight for physiotherapists and other healthcare professionals in designing early postpartum rehabilitation programs after Caesarean section.

However, this case report has several limitations. The findings are based on a single patient, so they cannot be generalized to all postpartum Caesarean section patients. The observation period was also limited to 72 hours, which means that long-term outcomes related to pain, edema reduction, mobility recovery, breastfeeding performance, and quality of life could not be evaluated. In addition, the improvement observed in this patient may have been influenced by other factors, such as analgesic medication, standard postoperative care, catheter removal, psychological adaptation, and the natural healing process. Future

studies with larger samples, longer follow-up periods, and controlled study designs are needed to confirm the effectiveness of integrated physiotherapy interventions in post-Caesarean section rehabilitation.

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