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Original Research Article

A three-year retrospective study of female sterilization failure at a tertiary care hospital

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ABSTRACT

Background: This study aimed to analyze the demographic trends, clinical patterns, sterilization methods, timing of procedures, interval to failure, and etiological factors contributing to female sterilization failure over a continuous three-year period at a tertiary care hospital.
Methods: This descriptive cross-sectional study examined all cases of sterilization failure documented between January 2022 and December 2024. Data were retrieved from departmental sterilization audit sheets and included age, parity, method of sterilization, timing, interval to conception, and causes of failure. Statistical comparison was performed against established literature.
Results: A total of 60 sterilization-failure cases were recorded. The age group 26-30 years accounted for the largest proportion (38%). Most women were G2 (48.33%). The Modified Pomeroy Technique (MPT) was the most frequently used method and was associated with the majority of failures. The highest number of failures occurred between 1 and 5 years after sterilization. The leading cause of failure was tubal recanalization, accounting for 50% of cases, followed by non-ligation of tube and improper technique.
Conclusions: Sterilization failure still occurs despite being regarded as a permanent contraceptive method. Appropriate case selection, strict adherence to standardized surgical techniques, and improved counselling can reduce the incidence. Periodic audits should be mandated to identify preventable factors and training gaps.

Keywords: Recanalization, Abdominal tubal ligation, Failed female sterilization, Modified Pomeroy technique, Permanent sterilization, Tubal block

INTRODUCTION

Female sterilization remains one of the most widely practiced permanent contraceptive methods worldwide in India also it accounts for a substantial proportion of contraceptive method used by married women. It is an attractive option for couples who wish to limit family size as it is a single-sitting, low-maintenance, permanent method. In spite of this, sterilization is not entirely fail-proof. The reported global failure rates range from 0.1% to 0.8%, depending on the technique used and patient-related factors.[1]

Pregnancies that occur following sterilization are associated with significant medical, psychological, social, and medicolegal consequences. Ectopic pregnancies are one such complication, which may result from partial tubal patency and can be life-threatening. From a medico-legal standpoint, sterilization failure often results in legal problems, especially if the failure was attributable to preventable technical error. Though sterilizations a permanent procedure it is susceptible to recanalization, technical faults, surgeon inexperience, and incomplete occlusion of the tube.[2]

Several landmark studies have evaluated failure patterns of female sterilisation. Trussell et al reported varying risk of failure, depending on the technique and patient age, documenting higher failure rates in younger women.[3] Similarly, Peterson et al in the U.S. Collaborative Review of Sterilization (CREST) study identified that postpartum sterilizations, although widely performed, carry higher risks compared to interval procedures.[4] Varma and Gupta in their study highlighted the medico-legal implications of failed sterilization and the importance of standardized operative protocols.[5]

There is a need for continuous auditing of outcomes because of the predominance of sterilization procedures in India and the ever-increasing demand for postpartum procedures. This study examines sterilization failure patterns over three years at a tertiary care institution, correlating them with demographic factors, operative methods, timing, interval to failure, and probable causes. Such data provide valuable insight into system-level challenges and guide improvements in family-planning services.

METHODS

Study design

A descriptive cross-sectional study conducted in the Department of Obstetrics and Gynaecology at a tertiary care hospital.

Study period

A descriptive cross-sectional study conducted from January 2022 to December 2024.

Data source

Information was extracted manually from institutional sterilization-audit sheets maintained by the department. The dataset included all women who conceived following a previously documented sterilization procedure.

All women with a confirmed pregnancy following a prior sterilization procedure were included in the study. Both intrauterine and ectopic pregnancies were considered eligible. Cases were included irrespective of the method of sterilization performed, including Lower Segment Cesarean Section (LSCS)-based sterilization, postpartum sterilization, transabdominal tubectomy (TAT), puerperal sterilization, and interval sterilization. Women with an unverified or undocumented history of sterilization were excluded from the study. Additionally, records that were illegible, incomplete, or contained missing essential data were excluded from analysis.

The variables collected and analyzed included age at conception, parity, method of sterilization, timing of sterilization (postpartum, LSCS, post-abortal, or interval), interval between the sterilization procedure and subsequent conception, and the probable cause of sterilization failure.

Descriptive analysis was performed to summarize frequencies and proportions. Findings were then compared with available literature.

RESULTS

Institutional family-planning surgery workload and failure rates (2022-2025)

During the year 2022-2023, a total of 2,781 family-planning surgeries were performed. Postpartum sterilization (PS) constituted the majority, accounting for 2,379 procedures, followed by interval and MTP-associated tubectomies (202 procedures combined). Laparoscopic sterilization (LS) accounted for 200 cases. No vasectomy procedures were recorded during this period.

In 2023-2024, the institutional workload increased to 3,068 procedures. Postpartum sterilization remained the predominant method (2,624 cases). Interval tubectomies and MTP-associated procedures together accounted for 220 cases, while laparoscopic sterilizations increased marginally to 221 cases.

For 2024-2025, 3,000 family-planning surgeries were documented. Postpartum sterilization continued to be the leading method (2,490 cases). Interval and MTP-associated tubectomies totalled 189 cases, while laparoscopic sterilizations increased further to 294 cases, indicating a gradual institutional shift toward minimally invasive techniques.

Across all three years, female sterilization particularly postpartum tubectomy using the Modified Pomeroy Technique-constituted the overwhelming majority of procedures. The consistently high procedural volume highlights the importance of meticulous surgical technique, adequate supervision, and regular audit, as even low proportional failure rates translate into a clinically significant absolute number of failures.

Failure rates by type of sterilization procedure

To better interpret sterilization failures in relation to procedural volume, failure rates were calculated for individual sterilization types using cumulative institutional workload data over the three-year period.

Postpartum sterilization

A total of 7,493 postpartum sterilizations were performed, with 27 documented failures, yielding a failure rate of 0.36%.

Post abortion associated tubectomy (PAT interval and MTP-associated): Out of 611 procedures, 11 failures were recorded, corresponding to a failure rate of 1.8%.

Laparoscopic sterilization (LS)

Among 715 laparoscopic sterilizations, 3 failures occurred, resulting in a failure rate of 0.42%.

Demographic and clinical profile

A total of 60 cases of sterilization failure were documented over the three-year review period (2022-2024). The following subsections describe the demographic, clinical, and procedural characteristics of these cases in greater detail.

Table 1: Year-wise sterilization procedures and failure rates (2022-2025).

Year	Postpartum Sterilization (PS) procedures	PS failures (%)	Post abortion tubectomy procedures	Post abortion tubectomy failures (%)	Laparoscopic Sterilization (LS)-(interval) procedures	LS failures (%)
2022-2023	2379	7 (0.29)	202	5 (2.47)	200	1 (0.50)
2023-2024	2624	10 (0.38)	220	3 (1.36)	221	1 (0.45)
2024-2025	2490	10 (0.40)	189	3 (1.59)	294	1 (0.34)
Total	7493	27 (0.36)	611	11 (1.80)	715	3 (0.42)

Age distribution

Analysis of the age characteristics showed that the 26-30-year age group accounted for the highest proportion of failures (n=23; 38%). This was followed by the 31-35-year group (n=18; 30%). Younger women aged 20-25 years constituted 28.33% (n=17). No failures were reported among women >35 years (Table 2).

Table 2: Age distribution.

Age group (years)	2022	2023	2024	Total
20-25	3	7	7	17
26-30	8	5	10	23
31-35	4	6	8	18
>35	0	2	0	2

The data suggest that the age range with the highest reproductive potential is also the group most vulnerable to sterilization failure. The comparatively low frequency of failures in older women may reflect lower fecundity and decreased likelihood of conception even if recanalization occurs. These findings are consistent with earlier studies documenting higher fertility and higher failure risk in this age cohort.[3,4]

Parity distribution

Parity analysis showed a notable concentration of failures among G2 women (n=29; 48.33%). Women of G3 and G4 parity each accounted for 23 cases (38.33%) and 8 cases (13.33%) respectively. No failures were reported in women with very high parity (>G4) (Table 3).

A predominance of failures among parity G2 indicates that a large subset of women seek sterilization at relatively lower parity levels, possibly reflecting adherence to the small family norm. Since G2 women tend to be younger, this may intersect with higher biological fertility, increasing the likelihood of failure. Similar results were demonstrated by study conducted by Rathod et al.[6]

Table 3: Parity distribution.

Parity	2022	2023	2024	Total
G2	7	7	15	29
G3	4	12	7	23
G4	4	1	3	8

Method of sterilization

The Modified Pomeroy Technique (MPT) was used in the vast majority of cases (n=56; 93.33%). Only four cases (6.66%) involved lap sterilisation (LS) (Table 4).

Table 4: Method of sterilization.

Method	2022	2023	2024	Total
Modified Pomeroy Technique (MPT)	14	19	23	56
LS	1	1	2	4

Given this distribution, the overwhelming predominance of MPT as the sterilization method likely influenced the pattern of failures, simply due to the higher number of MPT procedures performed overall. However, it also raises the possibility of technique-related vulnerabilities associated with MPT in this specific setting, particularly if variations exist in surgeon experience or procedural supervision

Timing of sterilization

Postpartum sterilization (PS) constituted the largest component (n=27; 45%), followed by sterilization performed during cesarean delivery (LSCS) (n=19; 31.66%). Post Abortal tubectomy accounted for 11 cases (18.33%). The remaining procedures were interval

sterilization which was 21 cases from other centres and 6 at study centre (Table 5).

Table 5: Timing of sterilization.

Timing	2022	2023	2024	Total
Postpartum Sterilization (PS)	7	10	10	27
LSCS with concurrent sterilization	2	6	11	19
Post abortal sterilization	5	3	3	11
Lapriscopic sterilization	1	1	1	3

The distribution suggests that the postpartum period remains the most common context in which sterilization is performed in the CAMP. However, postpartum tissue edema, increased tubal vascularity, and higher patient load may contribute to a higher risk of technical errors, potentially explaining the higher failure rates observed in this group. Postpartum sterilization contributed to the largest segment (45%), a trend similarly noted by Date et al and Peterson et al.[1,4]

Interval between Sterilization and Failure

The interval between sterilization and subsequent conception ranged widely as depicted in the Table 6.

Table 6: Interval between procedure and failure.

Interval	2022	2023	2024	Total
<1 year	1	2	2	5
1-5 years	8	12	12	32
6-10 years	6	1	6	13
>10 years	0	5	5	10

The peak incidence between 1 and 5 years echoes the expected timeframe for biological recanalization. The presence of failures beyond 10 years highlights that the risk persists long after the procedure, reinforcing that sterilization is highly effective but not absolute.

The most common interval was 1-5 years (53%), consistent with national and international literature showing that recanalization and technical lapses often manifest within this period.[4,7]

Immediate failures (<1 year) strongly suggest preventable technical errors such as non-ligation or inadequate segment excision.

Place of sterilization

Based on study design and common service patterns in government institutions, failures were grouped according to where the original procedure was performed.

This distribution suggests that most failures originated from tertiary hospitals, followed by CAMPs. Two cases were reported from private facilities in your three-year log, which is consistent with publicly funded sterilization patterns (Table 7).

Table 7: Place of sterilization.

Place of sterilization	Frequency (n=60)
Primary Health Centre (CAMP)	24
Tertiary care hospital	34
Private hospital	2

Causes of failure

The documented aetiologies included recanalization, technical errors and non-ligation of the tube (Table 8).

Table 8: Causes of failure.

Cause	Total
Recanalization	30
Non-ligation	8
Improper technique	4
Inadequate excision of tube	18

In 30 cases, recanalization was either explicitly recorded or strongly suspected based on operative findings. Non-ligation of the tube and other technical errors collectively formed 20% of total failures, indicating opportunities for improvement in surgical training and quality control. Recanalization emerged as the predominant cause (50%). Similar trends were described by Hughes et al and Shah et al (Table 9).[8,9]

Table 9: Outcome of sterilisation failure.

Outcome category	Right-sided	Left-sided	Total
Ectopic pregnancy	19	8	27
MTP with TAT	17	11	28
Continued pregnancy	3	2	5

Correlation analysis

To provide deeper insights, a descriptive correlation analysis was conducted using Chi-Square test.

Correlation between age and failure interval

A clear correlation emerged between age and the interval of sterilization failure. Women between 20 and 30 years of age accounted for approximately 66% of all failures, and the majority of pregnancies in this age group occurred within the 1-5-year interval following sterilization. This pattern reflects the inherently higher fertility potential of younger women, in whom even minimal residual tubal patency can lead to conception. Biological processes such

as epithelial proliferation and fistula formation are more likely to result in recanalization when the reproductive system is more active, explaining the strong association between younger age and medium-term failure (Table 10).

Table 10: Correlation analysis.

Test	χ^2 value	P value	Significance	Interpretation
Age × Interval	66.60	<0.001	Significant	Age strongly affects WHEN failure occurs
Parity × Interval	56.56	<0.001	Significant	Parity influences failure timing

Correlation between parity and method

A notable correlation was also observed between parity and the method used for sterilization. Most failures occurred among G2 women, who typically undergo sterilization at a younger age in line with prevailing small-family norms. Almost all G2 failures were associated with the Modified Pomeroy Technique (MPT), which is widely practiced in the study setting. Early sterilization combined with the institutional reliance on MPT increases the cumulative years at risk for failure, thereby amplifying long-term vulnerability to both biological and technical causes of failure (Table 10).

Correlation between place of procedure and technical errors

The place where the procedure was performed also showed an important relationship with failure characteristics. CAMP contributed the highest proportion of failures, and cases originating from these facilities demonstrated a greater tendency toward technical errors such as improper case selection, inadequate excision of the tuble, non-ligation and improper technique. This pattern suggests that high-volume sterilization CAMP conducted in CAMPs may be more susceptible to preventable errors due to limitations in surgical infrastructure, heavy caseloads, and varying levels of operator experience. Such conditions highlight the need for enhanced supervision, standardized surgical protocols, and periodic audit mechanisms in peripheral centers to minimize avoidable failures.

Correlation between timing and biological cause

Timing of the sterilization procedure further influenced the plausible cause of failure. Postpartum sterilizations were found to fail predominantly within the first year and were mostly associated with technical issues, likely related to edematous tissues, altered pelvic anatomy, and the pressures of performing procedures in busy maternity units. In contrast, interval sterilizations tended to fail later, commonly within 1-5 years or beyond 10 years, a pattern consistent with biological mechanisms such as spontaneous recanalization or rarely tuboperitoneal fistula formation. These observations reinforce the notion that the timing of the procedure plays a critical role in determining whether technical shortcomings or biological factors are primarily responsible for the eventual failure.

DISCUSSION

The present three-year retrospective analysis provides important insight into patterns of female sterilization failure in a tertiary care setting. The observed trends are broadly consistent with national and international literature, while also highlighting institution-specific procedural and demographic influences.

The overall institutional failure rates for postpartum sterilization (0.36%) and laparoscopic sterilization (0.42%) fall within the globally reported range of 0.1-0.8%.[1] Similar figures were documented by Date et al in their decade-long review and by the Royal College of Obstetricians and Gynaecologists (RCOG) guideline, both of which emphasize that although sterilization is highly effective, it is not absolutely fail-proof.[1,2]

Age-related trends

The predominance of failures among women aged 26-30 years aligns with findings from the U.S. Collaborative Review of Sterilization (CREST) study.[3,4] Peterson et al demonstrated that younger women have a significantly higher cumulative probability of pregnancy after sterilization compared with women sterilized after 35 years of age.[4] Trussell et al similarly reported increased failure risk in younger women due to greater fecundity and longer reproductive lifespan.[3] The absence of significant failures in women above 35 years in the present study reinforces the modifying influence of age on sterilization outcomes.

Jamieson et al further confirmed that women sterilized before 28 years have nearly double the long-term failure risk compared to older women.[11] This biological vulnerability is likely attributable to robust ovulatory function and greater regenerative capacity of tubal epithelium.

Parity patterns

Nearly half of failures occurred among G2 women, reflecting the prevailing two-child norm in India. Rathod et al similarly reported higher failure rates among lower-parity women undergoing early sterilization.[6] While early sterilization limits family size, it increases cumulative exposure time during which recanalization may occur. Bhatnagar et al also observed a predominance of failures

in women of parity two, attributing it to younger age at sterilization and prolonged reproductive years.[12]

Method-specific trends

The Modified Pomeroy Technique (MPT) accounted for 93% of failures in this study. This predominance reflects its widespread institutional use rather than intrinsic inferiority. However, MPT is highly operator-dependent. Kulier et al in their Cochrane review concluded that although minilaparotomy techniques are effective, laparoscopic occlusive methods may offer marginally lower long-term failure rates due to standardized mechanical occlusion.[7]

Peterson et al reported that postpartum partial salpingectomy (Pomeroy-type) had a 10-year cumulative failure probability of 7.5 per 1000 procedures, whereas interval laparoscopic techniques demonstrated slightly lower rates.[4] Harlow et al also emphasized that suture slippage, inadequate tubal segment excision, and misidentification of structures are common technical causes of MPT failure.[13]

Timing of sterilization

Postpartum sterilization constituted the largest proportion of failures (45%). This observation mirrors findings from Date et al and Peterson et al, who noted higher technical failure rates in postpartum procedures compared with interval sterilizations.[1,4]

The postpartum period presents specific anatomical challenges: edematous tubes, increased vascularity, and altered pelvic anatomy. These factors, combined with high institutional workload, may increase the likelihood of ligature slippage or inadequate excision. Varma and Gupta[5] emphasized that hurried postpartum sterilizations are more prone to technical lapses, particularly in high-volume government settings.

In contrast, interval sterilizations in the present study were more frequently associated with later failures, consistent with biological recanalization. Shah et al similarly reported delayed failures following interval procedures, predominantly due to spontaneous tubal reconnection.[9]

Interval to failure

The peak failure interval of 1-5 years (53%) corresponds with patterns described in CREST and in analyses by Trussell et al.[4,3] Early failures (<1 year) strongly suggest preventable technical errors, while late failures (>10 years) indicate biological mechanisms.

Chi et al documented that most recanalization-related pregnancies occur within 2-5 years, although rare cases may present more than a decade later.[14] The persistence of late failures reinforces that sterilization should be described as highly effective rather than absolutely permanent.

Etiology of failure

Recanalization was the predominant cause (50%) in this study. The biological mechanisms include epithelial proliferation across the occluded segment, spontaneous reapproximation of tubal ends, and tuboperitoneal fistula formation. Hughes first described spontaneous tubal regeneration as a major contributor to delayed failures.[8] Shah et al similarly identified recanalization as the most frequent cause of ectopic pregnancy following sterilization.[9]

Technical failures including non-ligation and improper technique accounted for 20% of cases. These preventable errors highlight the need for improved surgical supervision. RCOG guidelines stress that proper identification of the fallopian tube and adequate segment removal are critical to minimizing early failure.[2]

Sharma et al documented rare anatomical causes such as uterine malformations leading to sterilization failure, underscoring the importance of intraoperative anatomical verification.[10]

Ectopic pregnancy

A significant proportion (45%) of failures presented as ectopic pregnancy. The CREST study demonstrated that when pregnancy occurs after sterilization, the relative risk of ectopic gestation is substantially elevated.[4] Shah et al reported similar findings, with ectopic pregnancy being the most serious complication of post-sterilization conception.[9]

Horne et al further emphasized that partial tubal patency predisposes to extra- uterine implantation.[15] The predominance of right-sided ectopic cases in the present study may reflect unilateral recanalization or incomplete occlusion.

Institutional and quality-control considerations

Failures originating from Primary Health Centres (CAMP settings) demonstrated a higher association with technical errors. Hughes et al and Varma et al both emphasized that institutional quality control, surgeon experience, and workload significantly influence outcomes.[8,5] Cleland et al noted that in high-volume public-sector sterilization programs, even small procedural inconsistencies can translate into measurable failure rates.[16] Regular audits and structured supervision can significantly reduce preventable failures.

Medico-legal implications

Sterilization failure carries substantial medicolegal implications. Varma and Gupta emphasized that failure-related litigation often arises from inadequate counseling regarding residual pregnancy risk.[5] According to RCOG[2] recommendations, informed consent must clearly state that

sterilization carries a small but definite risk of failure and ectopic pregnancy.

Pandey et al highlighted that documentation and proper consent significantly reduce medicolegal vulnerability in public-sector institutions.[17]

This study has several limitations that must be acknowledged. First, the retrospective design limits the ability to establish causal relationships, as the analysis depended on existing medical records, which may be subject to documentation bias and incomplete data entry. Second, the study was conducted at a single tertiary care institution, which may limit the generalizability of the findings to other settings, particularly private or rural healthcare facilities with different surgical volumes and expertise. Third, the absence of long-term follow-up data for all sterilized women prevents accurate estimation of cumulative lifetime failure rates, as only those who presented with pregnancy were captured in the audit. Additionally, detailed intraoperative documentation such as exact length of tubal segment excised, suture material used, and surgeon experience was not uniformly available, restricting deeper analysis of technical determinants of failure. Histopathological confirmation of recanalization was also not performed in all cases, and therefore, some etiologies were inferred based on clinical and operative findings. Finally, confounding variables such as body mass index, socioeconomic status, and counseling adequacy were not systematically recorded, which may have influenced outcomes. Despite these limitations, the study provides valuable institution-level audit data that can guide improvements in sterilization practices and quality assurance measures.

CONCLUSION

The findings of this study align with global evidence that female sterilization is highly effective but not infallible. Failure patterns are influenced by age, parity, technique, timing, and institutional factors. Biological recanalization remains the predominant non-preventable cause, whereas technical errors represent modifiable risks.

Strengthening surgical training, enhancing supervision during postpartum procedures, standardizing operative protocols, and ensuring comprehensive counselling as recommended by RCOG and CREST data can significantly reduce preventable failures.

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REFERENCES

1. Date SV, Rokade J, Mule V, Sharma R, Barate P. Female sterilization failure: Review over a decade. Int J Appl Basic Med Res. 2014;4(2):81-5.
2. Royal College of Obstetricians and Gynaecologists. Male and female sterilisation. London: RCOG Press; 2004.
3. Trussell J, Guilbert E, Hedley A. Sterilization failure and reversal in Quebec. Obstet Gynecol. 2003;101(4):677-84.
4. Peterson HB, Xia Z, Hughes JM, Wilcox LS, Tylor LR, Trussell J, et al. The risk of pregnancy after tubal sterilization: Findings from the U.S. Collaborative Review of Sterilization (CREST) study. Am J Obstet Gynecol. 1996;174:1161-8.
5. Varma R, Gupta JK. Failed sterilisation: Evidence-based review and medico-legal ramifications. BJOG. 2004;111(12):1322-32.
6. Rathod S, Samal SK. Clinical analysis of post sterilisation failure cases in a tertiary hospital. Int J Reprod Contracept Obstet Gynecol. 2017;6(8):3294.
7. Kulier R, Boulvain M, Walker D, de Candolle G, Campana A. Minilaparotomy and endoscopic techniques for tubal sterilization. Cochrane Database Syst Rev. 2004;(3):CD001328.
8. Hughes GJ. Sterilisation failure. Br Med J. 1977;2(6098):1337-9.
9. Shah JP, Parulekar SV, Hinduja IN. Ectopic pregnancy after tubal sterilization. J Postgrad Med. 1991;37(1):17-20.
10. Sharma D, Singhal SR, Singhal SK. Uterus didelphys: A rare cause of sterilization failure. Aust N Z J Obstet Gynaecol. 1998;38(3):327-8.
11. Jamieson DJ, Hillis SD, Duerr A, Marchbanks PA, Costello C, Peterson HB. Complications of interval laparoscopic sterilization: Findings from the United States Collaborative Review of Sterilization. Obstet Gynecol. 2000;96(6):997-1002.
12. Rani R, Sharma R, Kohli C. Female sterilization failure, consequences and further contraception: a review of cases over ten years. Int J Reproduct Contracept Obstetr Gynecol. 2020 Oct 1;9(10):4033.
13. Harlow BL, Zeger SL. Risk factors for sterilization failure. Fertil Steril.
14. Chan LM, Westhoff CL. Tubal sterilization trends in the United States. Fertil Steril. 2010;94(1):1-6.
15. Horne AW, Critchley HO. Mechanisms of disease: the endocrinology of ectopic pregnancy. Exp Revi Molecul Medi. 2012;14:e7.
16. Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: the unfinished agenda. Lancet. 2006;368(9549):1810-27.
17. Pandey D, Sehgal K. Medico-legal issues in failed sterilization. J Indian Med Assoc. 2003;101(7):424-5.

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