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# STUDY OF DIAGNOSTIC LAPAROSCOPIC FINDINGS IN PRIMARY AND SECONDARY INFERTILITY


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**ABSTRACT** Infertility, a complex issue with social and psychological implications, affects 8–12% of couples globally, with higher prevalence in developing countries like India. This retrospective study evaluates the diagnostic utility of laparoscopy in 64 women aged 20–40 years, presenting with infertility at a tertiary care hospital. Among the participants, 62.5% had primary infertility, and 37.5% had secondary infertility. Laparoscopy revealed abnormalities in 79.69% of cases, underscoring its pivotal role in diagnosing multifactorial etiologies. Tubal pathologies were the most prevalent findings (53.12%), followed by ovarian (43.75%) and uterine abnormalities (17.18%). Key pathologies included pelvic inflammatory disease, chocolate cysts, and fibroids. Interestingly, while primary infertility was associated with higher rates of ovarian and uterine abnormalities, tubal pathologies were equally distributed across groups. The study also highlights the limitations of non-invasive methods like ultrasonography in detecting conditions such as endometriosis and pelvic adhesions. The findings reaffirm diagnostic laparoscopy as a minimally invasive, cost-effective, and indispensable tool in infertility evaluation, offering critical insights for individualized management.


**KEYWORDS :** Infertility, Diagnostic Laparoscopy, Tubal Pathologies, Ovarian Pathologies, Endometriosis

## INTRODUCTION

Parenthood is a fundamental milestone in many societies, especially in cultures where pro-natal values prevail. In these societies, motherhood is often regarded as essential to feminine identity and societal expectations. Childlessness, therefore, carries profound social, psychological, cultural, and economic consequences, with women bearing the greater burden of stigma and pressure.

Infertility is defined as the inability of a couple to conceive after one year of regular, unprotected intercourse. It can be classified as primary infertility, where a woman has never conceived, or secondary infertility, which refers to the inability to conceive after a prior pregnancy, regardless of the outcome. According to the World Health Organization (WHO), infertility affects 8–12% of couples globally, with higher prevalence in developing regions. In India, infertility rates among reproductive-age couples have increased from 13% in 1981 to 16% in 2001, with variations across states.

Infertility arises from a multitude of social, biological, and environmental factors. Common causes include menstrual disorders, obesity, thyroid diseases, uterine and tubal factors, ovulation dysfunction, and lifestyle-related issues such as stress and obesity. The evaluation of infertility typically begins after one year of unprotected intercourse, or earlier if the female partner is over 35 years old due to declining fertility and increased risk of miscarriage with age.

In resource-limited settings like India, comprehensive investigations are often constrained. Diagnostic laparoscopy, as a minimally invasive and cost-effective procedure, plays a pivotal role in evaluating unexplained infertility. It allows direct visualization of pelvic organs, identifying conditions such as endometriosis, adhesions, and tubal blockages, which may not be detected through non-invasive methods. When combined with chromopertubation, it remains the gold standard for assessing tubal patency.

This study aims to evaluate the role of laparoscopy as a safe, accurate, and cost-effective tool in the diagnosis and management of infertility, providing insights into its utility in identifying pathologies contributing to primary and secondary infertility.

## MATERIALS AND METHODS

A retrospective study was conducted at a tertiary care hospital, involving 64 patients diagnosed with infertility. The study included 40 cases of primary infertility and 24 cases of secondary infertility.

**Inclusion Criteria:**

1. Women aged 20–40 years.
2. Patients with infertility complaints of more than one year.

**Exclusion Criteria:**

1. Patients with contraindications to laparoscopy.
2. History of pelvic surgery in the preceding six months.

Laparoscopic evaluations were conducted using standard protocols. Tubal patency was assessed with chromo-pertubation, and the uterus, ovaries, and peritoneal cavity were evaluated for structural abnormalities. Data were analyzed using SPSS, with significant findings categorized by type of infertility and demographic factors.

## RESULTS

In our study majority of the patients had primary infertility (N=40 , (62.5%) and secondary infertility was reported in 24 patients (37.5%) .

### Socio-demographic Characteristics

The Socio-demographic characteristics of females with infertility were highlighted in Table 1.we Observed no statistically significant difference in the socio demographic factors amongst both the groups (p>0.05)

**Table 1.Socio-demographic Characteristics Of Women With Infertility Done Laparoscopy (N=64)**

| Variable | Primary (N=40) | Secondary (N=24) | Total N=64 | P Value |
|---|---|---|---|---|
| Age Mean ± (Standard deviation) | 32 ±5.0 | 35±6.25 | | 0.4506 |
| Median (Inter-quartile range) | 32 (29-35) | 34(30-45) | | |
| Min-Max | 21-34 | 28-48 | | |
| Age group | | | | |
| 21-24 years | 2(5%) | 0(0%) | 2(3.12%) | 0.3765 |
| 25-29 years | 12(30%) | 8(33.33%) | 20(31.25%) | |

| | | | | |
|---|---|---|---|---|
| 30-34 years | 19(47.5%) | 7(29.16%) | 26(40.62%) | |
| 35-39 years | 6(15%) | 6(25%) | 12(18.75%) | |
| >=40 years | 1(2.5%) | 3(12.5%) | 4(6.25%) | |

**Menstrual History:**

We observed no statistically significant difference in the menstrual history of females in both the groups (p>0.05)

**Table 2**

| | Primary (N=40) | Secondary (N=24) | Total (N=64) | P value |
|---|---|---|---|---|
| Regularity | | | | |
| Regular | 20(50%) | 10(41.66%) | 30(46.87%) | 0.5406 |
| Irregular | 20(50%) | 14(58.34%) | 34(53.13%) | |
| Duration of cycle (Mean) | 28.54 days ± 2.05 | 28.20 days ± 1.75 | | 0.362 |
| Present | 12(30%) | 8(33.33%) | 20(31.25%) | 0.475 |
| Absent | 28(70%) | 16(66.67%) | 44(68.75%) | |

**Sexual History:**

In our Study , we did not observed any statistically significant difference in the sexual history of females in both the groups (p>0.0)

**Table 3**

| Variable | Primary (N=40) | Secondary (N=24) | Total (N=64) | P value |
|---|---|---|---|---|
| | | | | |
| Frequency | | | | |
| Adequate (4-5 times a week) | 34(85%) | 16(66.66%) | 50(78.12%) | 0.6712 |
| Inadequate | 6(15%) | 8(33.34%) | 14(21.88%) | |
| Dysparunia | | | | |
| Present | 11(27.5%) | 10(41.66%) | 21(32.81%) | 0.743 |
| Absent | 29(72.5%) | 14(58.34%) | 43(67.19%) | |
| Use of Contraceptives | | | | |
| Present | 5(12.5%) | 5(20.83%) | 10(15.62%) | 0.5492 |
| Absent | 35(87.5%) | 19(79.17%) | 54(84.38%) | |

**Medical History**

The most commonly observed medical history was hypothyroidism (15.62% each) .we observed no statistically significant difference in the medical history of females in both the groups (p>0.05)

**Table 4**

| | Primary (N=40) | Secondary (N=24) | Total (N=64) | P VALUE |
|---|---|---|---|---|
| Hypothyroidism | 7(17.5%) | 3(12.5%) | 10(15.62%) | 0.156 |
| Diabetes | 2(5%) | 1(4.16%) | 3(4.68%) | |
| Hypertension | 1(2.5%) | 1(4.16%) | 2(3.12%) | |
| TB | 1(2.5%) | 0(0%) | 1(1.56%) | |

**Examination Findings**

We observed that the examination findings were comparable in females from both the groups (p>0.05)

**Table 5**

| | Primary (N=40) | Secondary (N=24) | Total (N=64) | P value |
|---|---|---|---|---|
| Obesity | | | | |
| Present | 8(20%) | 6(25%) | 14(21.87%) | 0.1679 |
| Absent | 32(80%) | 18(75%) | 50(78.13%) | |
| Per Speculum | | | | |
| External Genitalia | | | | |
| Normal | 40(100%) | 24(100%) | 64(100% | 1.000 |
| Abnormal | 0(0%) | 0(0%) | 0(0%) | |
| Vagina | | | | |
| Healthy | 40(100%) | 24(100%) | 64(100%) | 1.000 |
| Unhealthy | 0(0%) | 0(0%) | 0(0%) | |
| White discharges | | | | |
| Present | 2(5%) | 1(4.16%) | 3(4.68%) | 0.247 |
| Absent | 38(95%) | 23(95.84%) | 61(95.31%) | |
| Cervix | | | | |
| Normal | 40 (100% | 22(91.66%) | 60(93.75%) | 0.3284 |
| Abnormal | 0 (0%) | 2(8.34%) | 4(6.25%) | |
| Per vagina | | | | |
| Uterine position | | | | |
| Anteverted | 37(92.5%) | 22(91.66%) | 59(92.18%) | 0.469 |
| Retroverted | 3(7.5%) | 2(8.34%) | 5(7.82%) | |
| Uterine size | | | | |
| Normal | 32(80%) | 20(83.33%) | 52(81.25%) | 0.5821 |
| Bulky | 8(20%) | 4(16.67%) | 12(18.75%) | |
| Uterine mobility | | | | |
| Mobility | 34(85%) | 16(66.66%) | 50(78.12%) | 0.381 |
| Restricted | 6(15%) | 8(33.37%) | 14(21.87%) | |
| Forniceal tenderness | | | | |
| Present | 8(20%) | 3(12.5%) | 11(17.18%) | 0.4924 |
| Absent | 32(80%) | 21(87.5%) | 53(82.81%) | |
| Adnexal Mass | | | | |
| Present | 8(20%) | 4(16.66%) | 12(18.75%) | 0.3901 |
| Absent | 32(80%) | 20(83.34%) | 52(81.25%) | |

**Pre-operative Diagnosis**

**Table 6. Pre Operative Diagnosis Of Females Based On Ultrasound**

| Diagnosis | Primary (N=40) | Secondary (N=24) | Total (N=64) | P value |
|---|---|---|---|---|
| Tubal Occlusion and adnexal adhesion | 15(37.5%) | 10(41.67%) | 25(39.06%) | 0.5020 |
| Ovulatory factor | 14(35%) | 6(25%) | 20(31.25%) | |
| Uterine malformations | 7(17.5%) | 5(20.83%) | 12(18.75%) | |
| Endometriosis & Other | 4(10%) | 3(12.5%) | 7(10.93%) | |

It was observed that the most common pre operative diagnosis was Tubal Occlusion and adnexal adhesion (39.06%) followed by ovulatory factory (31.25%).

We observed no significant difference in the pre operative diagnosis of females in both the groups (p=0.5020

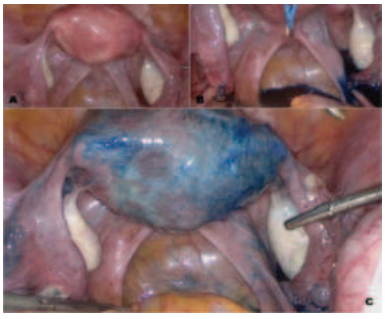
**Laproscopic Findings**

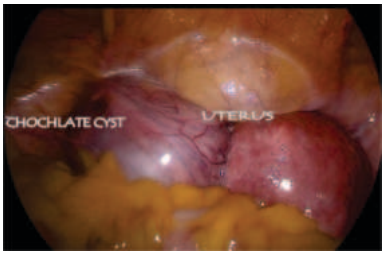
The table highlights that normal findings were observed in 20.31% of cases, with similar rates in primary (20%) and secondary (20.83%) infertility groups (p>0.05). Ovarian pathologies were the most common findings (43.75%), slightly more prevalent in primary infertility (45% vs. 41.66%, p>0.05). Tubal pathologies were identified in 53.12% of cases, with comparable rates in primary (50%) and secondary (55%) infertility groups (p>0.05). Uterine pathologies were noted in 17.18% of cases, predominantly in primary infertility (17.5% vs. 16.66%, p>0.05). Combination pathologies were more frequent in primary infertility but not statistically significant (p>0.05). Overall, no significant differences were found between the groups across all findings.

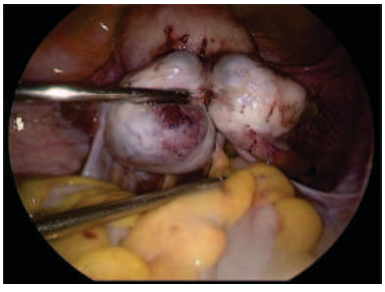
**Table7 Laparoscopic Findings (Primary vs. Secondary Infertility)**

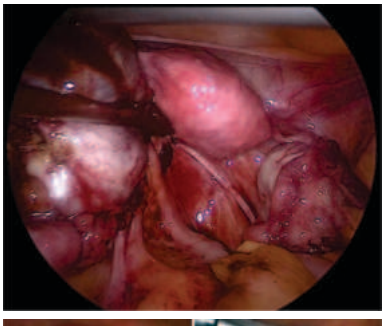
| Findings | Primary (N=40) | Secondary (N=24) | Total (N=64) | p-value |
|---|---|---|---|---|
| Normal Findings | 8 (20%) | 5 (20.83%) | 13 (20.31%) | 0.875 |
| Ovarian Pathologies | 18 (45%) | 10 (41.66%) | 28 (43.75%) | 0.657 |
| - Chocolate Cyst | 4 (10%) | 3 (12.5%) | 7 (10.93%) | 0.657 |
| - Tubo-Ovarian Mass | 5 (12.5%) | 2 (8.33%) | 7 (10.93%) | 0.520 |
| - Cystic Ovary | 3 (7.5%) | 2 (8.33%) | 5 (7.81%) | 0.713 |
| Tubal Pathologies | 22 (55%) | 12 (50%) | 34 (53.12%) | 0.732 |
| - Pelvic Inflammatory Disease | 5(20.83) | 10(25%) | 15 (23.43%) | 0.591 |

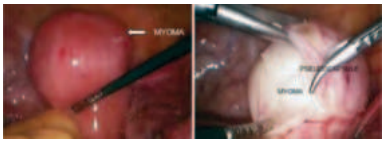
| | | | | |
|---|---|---|---|---|
| - Salpingitis | 3 (12.5%) | 6(15%) | 9 (14.06%) | 0.692 |
| - Hydrosalpinx | 3(12.5%) | 6 (15%) | 9 (14.06%) | 0.742 |
| Uterine Pathologies | 7 (17.5%) | 4 (16.66%) | 11 (17.18%) | 0.892 |
| - Fibroids | 2 (5%) | 0 (0%) | 2 (3.12%) | 0.381 |
| - Uterine Anomalies | 2 (5%) | 0 (0%) | 2 (3.12%) | 0.381 |
| Combination Pathologies | | | | |
| - Ovarian + Tubal | 6 (15%) | 3 (12.5%) | 9 (14.06%) | 0.769 |
| - Ovarian + Uterine | 4 (10%) | 1 (4.16%) | 5 (7.81%) | 0.394 |
| - Tubal + Uterine | 2 (5%) | 1 (4.16%) | 3 (4.68%) | 0.764 |
| - Ovarian + Tubal + Uterine | 2 (5%) | 1 (4.16%) | 3 (4.68%) | 0.764 |









## DISCUSSION

In our study of 64 infertile women, 62.5% (n=40) had primary infertility, and 37.5% (n=24) had secondary infertility. This distribution is consistent with similar studies, such as Shahzadi et al. (2024), where primary infertility was more common (71.9%), and secondary infertility accounted for 26.1%. Comparable trends were observed in studies by Khan et al. (2021) and Panchal & Shah (2016), with primary infertility reported in 64.35% and 68% of cases, respectively.

### Key Findings:

1. Normal Laparoscopic Findings:

In our study, 13 (20.31%) cases showed no abnormalities, distributed equally between primary (20%) and secondary infertility (20.83%). Similar findings were reported by Panchal & Shah (2016), where 28% of cases had normal findings.

2. Ovarian Pathologies:

Ovarian abnormalities were present in 43.75% of cases (45% in primary and 41.66% in secondary infertility). Chocolate cysts were the most common ovarian finding (10.93%). Comparable findings were reported by Wankhede et al. (2017), where polycystic ovaries and chocolate cysts were predominant ovarian factors, and Chimote et al. (2015), with endometriosis and ovarian cysts as leading causes.

3. Tubal Pathologies:

Tubal abnormalities were the most frequent finding (53.12%), with pelvic inflammatory disease (23.43%) being the most common pathology. Secondary infertility had slightly higher rates of tubal pathologies (55%) compared to Primary infertility (50%). Khan et al. (2021) and Wani et al. (2014) similarly highlighted tubal occlusion and pelvic inflammatory disease as dominant tubal factors.

4. Uterine Pathologies:

Uterine abnormalities, including fibroids and anomalies, were observed in 17.18% of cases, predominantly in primary infertility (17.5%). This aligns with findings by Kumar et al. (2017), where uterine factors were noted in 10% of cases.

5. Combination of Pathologies:

Combined ovarian, tubal, and uterine abnormalities were seen in 23.43% of cases, slightly more frequent in primary infertility. Similar trends were noted by Haider et al. (2010), where multi-factorial causes were observed in both infertility groups.

### Comparative Insights:

Studies like Khan et al. (2021) and Chimote et al. (2015) have shown higher rates of tubal blockages and pelvic adhesions in secondary infertility, while ovarian pathologies such as endometriosis and chocolate cysts were more frequent in primary infertility. Our findings corroborate these trends, highlighting the importance of diagnostic laparoscopy in identifying multifactorial etiologies.

## CONCLUSION

Diagnostic laparoscopy remains a critical tool for evaluating infertility, revealing abnormalities in 79.69% of cases in our study. Tubal pathologies were the most common findings (53.12%), followed by ovarian (43.75%) and uterine factors (17.18%). While primary infertility was associated with slightly higher rates of ovarian and uterine abnormalities, secondary infertility showed comparable tubal involvement. Diagnostic laparoscopy is the gold standard procedure to assess tubal status. Laparoscopy has better role than ultrasonography in diagnosing endometriosis and pelvic adhesions. Though it is an invasive procedure, complications are minimal with an experienced hand. Diagnostic laparoscopy is recommended in all the infertile women. Laparoscopy not only helps to find out different Causes of infertility, but it also guides us for further management Diagnostic laparoscopy remains indispensable in evaluating and addressing infertility, especially in cases with unexplained etiologies.

## REFERENCES

1. Practice Committee of the American Society for Reproductive Medicine. Definitions of infertility and recurrent pregnancy loss. FertilSteril 2008; 90:560.
2. Halvorson, L.M. Evaluation of the infertile couple in: William's Gynecology 22nd ed. The McGraw-Hill Companies Inc, 2012. pp 506-528.
3. Infertility in Kenya Survey Report, 2008. Ministry of Health, Kenya.

4. Matthews, T.,Mati, J.K. and Fomulu, J.N. A study of infertility in Kenya. Result of Investigation of the infertile couple in Nairobi. EAMJ 1981; 58:288-97.
5. Ouko, D.O and Ndavi, P.M. Laparoscopic and Laparotomy Findings in Patients Undergoing Tuboplasty for Infertility at Kenyatta National Hospital. J. Obst. Gyn. East. Cent. Afr. 2006; 19: 1-7.
6. WHO Technical Report Series. Recent Advances in Medically Assisted Conception Number 820, 1992, pp 1-111.
7. Okumu, C.V. Social background of tubal infertility at KNH, Nairobi, MMed. Thesis 1989, University of Nairobi.
8. Richardson, S.J., Senikas, V. and Nelson, J.F. Follicular depletion during the menopausal transition: evidence for accelerated loss and ultimate exhaustion. J ClinEndocrinolMetab 1987; 65:1231.
9. Gachuno, O.W., Rukaria, R.R and Wanyoike, G. Risk factors associated with tubal infertility at Nazareth Hospital. J. Obst. Gyn. East. Cent. Afr. 2009; 21: 1-6.
10. Bulun, S.E. Endometriosis. N Engl J Med 2009; 360:268.
11. Gupta, S., Goldberg, J.M, Aziz N., et al. Pathogenic mechanisms in endometriosis- associated infertility. FertilSteril 2008; 90:247.
12. Homer, H.A., Li T.C. and Cooke, I.D. The septate uterus: a review of management and reproductive outcome. FertilSteril 2000; 73:1.
13. Pritts, E.A. Fibroids and infertility: a systematic review of the evidence. ObstetGynecol Surv 2001; 56:483.
14. Perez-Medina, T., Bajo-Arenas, J., Salazar, F.et al: Endometrial polyps and their implication in the pregnancy rates of patients undergoing intrauterine insemination: a prospective, randomized study. Hum Reprod 20:1632, 2005 [PMID: 15760959].
15. Jackson, J.E, Rosen, M., McLean, T.et al. Prevalence of celiac disease in a cohort of women with unexplained infertility. FertilSteril 2008; 89:1002.
16. Clementini, E., Palka, C., Iezzi, I.et al. Prevalence of chromosomal abnormalities in 2078 infertile couples referred for assisted reproductive techniques. Hum Reprod 2005; 20:437.
17. Mbura, J.S.I. and Mgaya, H.N. Comparison of hysterosalpingography and laparoscopy in evaluation of tubal factor in infertility. J. Obst. Gyn. East. Cent. Afr. 1988;7: 78.
18. Gichuhi, L.N. A study to compare hysterosalpingography and laparoscopic findings in the investigation of female infertility at KNH. M.Med. Thesis. University of Nairobi, 1995.
19. Kumar, A. et al. Infertility in:Current Diagnosis & Treatment Obstetrics & Gynecology1$^{9th}$ed, The McGraw-Hill Companies Inc.2007. pp 374.
20. Sikolia, Z. W., Evan, S.andSamuel, G. M. Correlation between laparoscopic and histopathologic diagnosis of endometriosis. International Journal of Gynecology and Obstetrics 2011; 115:272–275.
21. Levy, Y., Lev-Sagie, A., Holtzer, H. Should laparoscopy be a mandatory component of the infertility evaluation in infertile women with normal hysterosalpingogram or suspected unilateral distal tubal pathology? Eur J ObstetGynecolReprod Biol. 2004; 114(1):64-8.
22. Heis, M., Amarin, Z., Ibrahim, A. Y. et al: Uterine and tubal anatomical abnormalities in infertile women: diagnosis with routine hysterosalpingography prior to selective laparoscopy. South African Journal of Radiology.2005; 14(2):4-8.
23. Audebert, A.J., Pouly, J.L. and Von Theobald, P. Laparoscopic fimbrioplasty: an evaluation of 35 cases. Hum Reprod. 1998; 13:1496.
24. Bildirici, I., Bukulmez, O., Ensari, A. et al: A prospective evaluation of tubes,Tulandi, T., Collins, J.A., Burrows, E. et al: Treatment-dependent and treatment- independent pregnancy among women with periadnexal adhesions. Am J Obstet Gynecol.1990; 162:354.
25. Donnez, J., Wyns, C. and Nisolle, M. Does ovarian surgery for endometriomas impair the ovarian response to gonadotropin? FertilSteril. 2001; 76:662.
26. Ndovi, E.D. Dye laparascopy at KNH. M.Med. Thesis. University of Nairobi, 1980.
27. Obura, T. Laparoscopic surgery: risks and informed consent. J. Obst. Gyn. East. Cent. Afr. 2009; 21: 29-36.
28. National Reproductive Health Policy of Kenya October 2007, Ministry of Health, Kenya.
29. National Reproductive Health Strategy 2009-2015, August 2009,Ministry of Health, Kenya.
30. Fisher, A.A., Laing, E.J., Stoeckel, E. J. Handbook for Family Planning Operations Research Design. 1991, New York: USA: Population Council.
31. Nderitu,C.M. Outcome of Open versus laparoscopic tuboplasty at Kenyatta National Hospital. M.Med. Thesis. University of Nairobi, 2007.
32. Melinda, M., Ronald, R.R., McDonald, P, et al,Why do people postpone parenthood? Reasons and social policy. Human Reproduction Update. 2011. 11(6): 848-860.
33. Committee on Gynecologic Practice of American College of Obstetricians and Gynecologists, Practice Committee of American Society for Reproductive Medicine. Age-related fertility decline: a committee opinion. FertilSteril. 2008; 90:486.
34. Faddy, M.J., Gosden, R.G., Gougeon, A., et al. Accelerated disappearance of ovarian follicles in mid-life: implications for forecasting menopause. Hum Reprod. 1992; 7:1342.