

Ruptured tubal pregnancy: predictors of delays in seeking and obtaining care in a Nigerian population

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Purpose: Morbidity and mortality from ruptured tubal pregnancies (RTPs) have been linked with delays in seeking and receiving care. Evaluation of the reasons for these delays and their contributions to maternal deaths is rarely done for women with RTPs in resource-constrained settings.

Patients and methods: This was a 3-year retrospective review of the case records of women with tubal pregnancies managed at the Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria. Clinical and sociodemographic parameters were obtained, including information on onset of symptoms and intervals between the symptoms and when help was sought and obtained at the hospital.

Results: There were 92 cases of tubal pregnancies, giving an incidence of 18 per 1,000 births. Most of the patients were married (74.7%), parous (64.9%), and urban dwellers (76.9%), and 11% were severely anemic on arrival. The case-fatality rate was 1.1% and 74.7% had delay in seeking care, while 82.4% of the women spent more than 2 hours after admission before surgical intervention. Rural dwellers (adjusted odds ratio 2.96, 95% confidence interval 1.08–8.36) and those without formal education (adjusted odds ratio 6.39, 95% confidence interval 1.06–67.30) had delays in seeking help, while problems with funds ($\chi^2=7.354$, $P=0.005$) and initial misdiagnosis ($\chi^2=5.824$, $P=0.018$) predicted delay in obtaining help at the hospital.

Conclusion: RTPs are common gynecological emergencies in our environment that are often associated with delayed decisions to seek help and obtain care. Efforts should be geared toward women's education and financial independence, improved hospital accessibility, and better diagnostic skills.

Keywords: delay, ruptured tubal pregnancies, predictors, health care, Nigeria

Introduction

Ectopic pregnancy (EP) is the implantation of the fertilized ovum in any site outside the endometrial cavity.¹ Although various sites have been described, the commonest is the fallopian tube: >98% of cases.² Ruptured tubal pregnancies (RTPs) remain a life-threatening gynecological condition for which patients often present to the emergency department, and are an important cause of morbidity and mortality in early pregnancy, particularly in the tropics.³

Worldwide, EP contributes 10%–15% of maternal deaths occurring in the first trimester.⁴ The increased global incidence has been attributed to an increase in pelvic infections, advances in assisted reproductive technology, tubal surgeries and sterilizations, use of intrauterine contraceptive devices, and improvements in diagnostic techniques leading to identification of cases that otherwise would have resolved before becoming symptomatic.^{5–7} Despite this, the case-fatality rate in many developed

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countries has been on the decline, because advances in technology have led to earlier diagnosis, increasing use of conservative surgeries, and medical management with the possibility of preserving future reproductive outcome.^{2,8,9}

However, many tubal EPs in low-resource nations, especially sub-Saharan Africa, would have ruptured by the time they reach the hospital and/or a diagnosis is made, thereby increasing the possibility of mortality.^{9–15} This situation could have been prevented with timely medical intervention. Therefore, at the heart of the matter is the issue of delays in seeking care or receiving care at health facilities.¹⁶ The delays may result from socioeconomic factors that influence or modify health-seeking behavior, difficulties with actual accessibility of health care facilities, or inadequate quality of care, including misdiagnosis by health care providers.^{10,17,18} Unfortunately, evaluation of the reasons for these delays and their contributions to maternal deaths is rarely done for women with RTPs in resource-constrained settings, the very population in which it is most needed.^{19,20}

In their landmark work, Thaddeus and Maine²⁰ developed a conceptual framework of a three-phase delay, an evaluation of the factors that contribute to maternal mortality from the onset of pregnancy-related complications to its outcome. They categorized delay in seeking care on the part of the individual, the family, or both as phase 1 delay, delay in reaching an adequate health care facility as phase 2 delay, and delay in receiving adequate care at the facility as phase 3 delay. Although there is a complex interplay between the phases, one type of delay is not inextricably linked with another. This template thus formed the basis on which we aimed to predict factors that could lead to delays in seeking and obtaining care by women with RTPs in a defined Nigerian population.

Patients and methods

The study was a retrospective review of women with RTPs at the Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti, Nigeria, from January 1, 2011 to December 31, 2013. The teaching hospital, located in the capital of Ekiti State in southwest Nigeria, has a 48-bed maternity wing and a gynecological section with 15 beds. It receives referrals from within the state and neighboring states, such as Ondo, Osun, and Kogi. Emergency cases are first managed at the Accident and Emergency Unit, which is manned by medical officers under the supervision of consultants.

The women who had EPs were identified from the registers in the emergency unit, operating theater, and

gynecological ward. The case records were then retrieved from the Medical Records Department. While the labor ward register was used to collect information on the deliveries conducted during the study period, the admission and discharge records of the gynecological ward provided the total number of gynecological admissions made over the 36 months of the study.

A detailed review of the case records of the patients was done. Clinical and sociodemographic information, which included age, marital status, level of education, and place of residence, were retrieved from the patients' case records and supplemented with details from the operating theater and ward registers. The time of onset of symptoms and the last complaint before presentation, including the time interval before surgical intervention, were obtained. Based on the level of our socioeconomic development and medical advancement, for this study, we defined delay in seeking care as not asking for medical help >24 hours after the first symptom. Also, delay in obtaining care was defined as spending more than 2 hours after hospital presentation before surgical intervention. Ethical approval was granted by the Ethics Committee of EKSUTH.

The data retrieved were entered into SPSS version 16. Univariate and multivariate statistical methods were employed. While sociodemographic variables were expressed as simple percentages, χ^2 tests and logistic regression modeling were used to identify the possible predictors of delay. The level of significance was set at $P < 0.05$ at a 95% confidence interval.

Results

During the study period, there were 92 cases of tubal EPs and 5,112 deliveries at EKSUTH. The incidence of tubal EPs was 18 per 1,000 births; 91 cases had RTPs, while only one was unruptured. There was one mortality out of the 92 cases, giving a case-fatality rate of 1.1%.

Table 1 shows the sociodemographic characteristics of the patients. Their mean age was 30.34 ± 5.74 years. The majority (46, 50.5%) of the women were between the ages of 30 and 39 years. Most of the patients were married (68, 74.7%), parous (59, 64.9%), and had attained at least a secondary level of education (74, 81.4%). Although most (70, 76.9%) were urban dwellers, only 14 (15.4%) of the women were skilled workers.

The mean duration of amenorrhea before hospital presentation was 5.54 ± 4.04 weeks. Forty-four (48.4%) patients had amenorrhea ranging between 7 and 12 weeks,

Table 1 Sociodemographic variables of patients

Variable	n (%)	Mean \pm SD
Age (years)		30.34 \pm 5.74
≤ 19	2 (2.2)	
20–29	36 (39.6)	
30–39	46 (50.5)	
≥ 40	7 (7.7)	
Marital status		
Single	19 (20.9)	
Married	68 (74.7)	
Separated	3 (3.3)	
Widowed	1 (1.1)	
Parity		
Nulliparous	25 (27.5)	
1–4	59 (64.9)	
≥ 5	7 (7.7)	
Education status		
None	4 (4.4)	
Primary	13 (14.3)	
Secondary	32 (35.2)	
Tertiary	42 (46.2)	
Occupation		
Unemployed/student	22 (24.2)	
Unskilled	21 (23.1)	
Semiskilled	34 (37.4)	
Skilled	14 (15.4)	
Residence		
Urban	70 (76.9)	
Rural	21 (23.1)	

Abbreviation: SD, standard deviation.

while 27 (29.7%) presented before a missed period. The commonest first symptom was abdominal pain (65, 71.4%), followed by vaginal bleeding (23, 25.3%). The mean time of hospital presentation after the onset of the first symptom was 159.37 hours. The majority of the patients also had abdominal pain as their last symptom (39, 42.9%), followed by syncope (36, 39.6%). The mean time of presentation at the hospital was 28.06 hours after the last symptom. The EP was on the right in 53 (58.2%) patients and in the ampulla in 57 (62.6%), with ten (11%) of the women being severely anemic on arrival at the hospital (Table 2).

Sixty-eight of the 91 patients (74.7%) sought medical help after 24 hours of onset of symptoms, while 75 of 91 (82.4%) of the women spent more than 2 hours in the hospital before surgical intervention.

A multiple regression analysis was run to determine which sociodemographic factors predict delay in seeking health care. None of them statistically significantly predicted the delay ($F_{6,80}=0.798$, $R^2=0.056$; $P=0.575$). However, further analysis of subsets of each independent variable (Table 3) shows that absence of formal education (adjusted odds ratio 6.39, 95% CI 1.06–67.30; $P=0.04$) and living in a rural

area (adjusted odds ratio 2.96, 95% CI 1.08–8.36; $P=0.04$) predicted delay in seeking medical help.

Predictors of delay in obtaining medical care after arriving at the hospital are evaluated in Table 4. Problem with funds ($\chi^2=7.354$, $P=0.005$) and initial misdiagnosis ($\chi^2=5.824$, $P=0.018$) predicted delay in obtaining care in the hospital. Other factors that were observed to be responsible for phase 3 delay, such as difficulty with getting blood, busy operating room, and awaiting ultrasound diagnosis, did not attain statistical significance.

Discussion

The results from this study show that RTP is a common cause of emergency gynecological consultations in our environment. Absence of formal education and residence in rural areas were found to predict delay in seeking medical attention.

Surveys from other nations have shown a significant positive relationship between women's level of education and the use of hospital services.^{21,22} The extent of enlightenment of a person could determine appreciation of subtle ill-health warning signals. Evidently, our patients' unacceptable mean time of presentation after onset of symptoms is a pointer. However, a few studies have furnished proof to the contrary, suggesting that higher levels of education may not necessarily translate to greater utilization of health services.^{23,24} Although consistent association of education with health-seeking behavior may be difficult to attain, our finding in this study is in consonance with the former assertion.

Since all the patients studied had RTPs, and the correlation between dwelling in a rural area and delay in seeking medical help reached significant levels, this could suggest that distance is another constraint to an early decision to seek help by patients. Similarly, Habib and Vaughan²⁵ and Rahaman et al²⁶ found that the greatest proportion of those who utilize health facilities dwell near them, with the figures decreasing as the distance increases.

Another perspective is that the distance possibly discouraged the women from seeking help until they experienced complications, and they had to travel far to obtain help. A study from rural Nigeria showed that as the distance from the facility increases, the percentage of people seeking help within 1 week of the onset of symptoms diminished.²⁷ Invariably, as rightly observed by Hamura et al in Papua New Guinea,¹⁶ rural dwellers are more likely to suffer tubal rupture. It is not impossible that some women who are pressed to seek help late only after the illness has become severe may

Table 2 Pattern of ectopic presentation

Variable	n (%)	Mean time \pm SD before hospital presentation	Range
Preceding amenorrhea		5.54 \pm 4.04 weeks	0–14 weeks
None	27 (29.7)		
≤ 6	17 (18.7)		
7–12	44 (48.4)		
≥ 13	3 (3.3)		
First symptom		159.37 \pm 184.20 hours	2–720 hours
Abdominal pain	65 (71.4)		
Vaginal bleeding	23 (25.3)		
Weakness	3 (3.3)		
Last symptom		28.06 \pm 40.54 hours	0.30–216 hours
Abdominal pain	39 (42.9)		
Vaginal bleeding	10 (11.0)		
Dizziness	5 (5.5)		
Abdominal distension	1 (1.1)		
Fainting (syncope)	36 (39.6)		
Location of ectopia			
Right	53 (58.2)		
Left	38 (41.8)		
Site			
Ampulla	57 (62.6)		
Fimbrial	9 (9.9)		
Isthmus	16 (17.6)		
Interstitial	9 (9.9)		
Admission PCV (%)			
≤ 18	10 (11.0)		
19–25	43 (47.3)		
26–32	31 (34.1)		
≥ 33	7 (7.7)		

Notes: Mean PCV admission, 24.35%; PCV range 11%–36%.

Abbreviations: SD, standard deviation; PCV, packed cell volume.

not get to a health facility before they die. These maternal deaths may account for underreporting of the contribution of RTPs to maternal mortality in our locality.

The impact of distance on the decision to seek help may be mitigated by the decentralization and even distribution of secondary health facilities that are adequately equipped with skilled personnel and essential supplies to cater for pregnancy-related complications. As such, the facilities are nearer the end users. The government should equally ensure the provision of sound road networks that make the journey shorter and easier. In role play, communities should be motivated to provide ready means of transportation to facilitate earlier decisions to seek specialized services.

Sadly as revealed in our findings, even when patients finally got to the hospital, the problem of funds and misdiagnosis significantly accounted for delay in obtaining care. As noted by the World Health Organization, phase 3 delays “represent a failure on the part of the health services to seize the last chance to save a woman”.²⁸

Patients need funds to obtain case files, pay for diagnostic investigations, and blood-transfusion services (including screening of the recipient and donor for blood-transmissible infections). Financial constraints therefore retard the progress of evaluation and management of the patients, as the fees can sometimes be quite high.²⁹ Needs for service payments during emergencies could hamper global efforts at reducing maternal mortality in low-resource settings.

For example, a study from Zaria, northern Nigeria, revealed that there was a sharp decline in obstetric admissions when the government introduced fees for antenatal care and delivery services in the hospital and a corresponding 56% increase in maternal deaths during the same period.³⁰ Implicitly, financial incapability of these patients may also indirectly contribute to delay in seeking care in the first instance, and extend to cause a lag in accessing much-needed care. Helping women become financially independent should be a priority of all: governments and societies at large.

Table 3 Predictors of delay in seeking health care

Variable	Delay seeking care, n (%)		Total, n (%)	Adjusted odds ratio	95% CI	P-value
	Yes	No				
Age (years)						
≤19	2 (100)	0	2 (100)	0.70	0.00–20.82	0.46
20–29	25 (69.4)	11 (30.6)	36 (100)	1.57	0.59–4.24	0.36
30–39	36 (78.3)	10 (21.7)	46 (100)	1.00		
≥40	5 (71.4)	2 (28.6)	7 (100)	1.58	0.27–7.64	0.65
Marital status						
Single	16 (84.2)	3 (15.8)	19 (100)	0.54	0.13–1.79	0.38
Married	49 (72.1)	19 (27.9)	68 (100)	1.00		
Separated	2 (66.7)	1 (33.3)	3 (100)	1.52	0.17–9.81	0.84
Widowed	1 (100)	0	1 (100)	0.85	0.00–102.63	0.54
Parity						
Nulliparous	21 (84.0)	4 (16.0)	25 (100)	0.51	0.14–1.54	0.22
1–4	42 (71.2)	17 (28.8)	59 (100)	1.00		
≥5	5 (71.4)	2 (28.6)	7 (100)	1.10	0.20–4.98	0.99
Education status						
None	1 (25.0)	3 (75.0)	4 (100)	6.39	1.06–67.30	0.04*
Primary	10 (76.9)	3 (23.1)	13 (100)	0.91	0.21–3.48	0.82
Secondary	26 (81.3)	6 (18.7)	32 (100)	0.67	0.21–1.97	0.45
Tertiary	31 (73.8)	11 (26.2)	42 (100)	1.00		
Occupation						
Unemployed/student	17 (77.3)	5 (22.7)	22 (100)	1.15	0.32–4.05	0.85
Unskilled	14 (66.7)	7 (33.3)	21 (100)	1.90	0.58–6.44	0.29
Semiskilled	27 (79.4)	7 (20.6)	34 (100)	1.00		
Skilled	10 (71.4)	4 (28.6)	14 (100)	1.57	0.39–6.17	0.55
Residence						
Urban	56 (80.0)	14 (20.0)	70 (100)	1.00		
Rural	12 (57.1)	9 (42.9)	21 (100)	2.96	1.08–8.36	0.04*

Note: * $P < 0.05$.

Abbreviation: CI, confidence interval.

More appropriate, though, will be the policy of free health care for all emergency cases in our hospitals.

Close to a quarter of the women in this study were initially misdiagnosed on presentation at the hospital. This resulted in delay in instituting appropriate management. As also observed in Papua New Guinea, misdiagnosis topped the list of causes of phase 3 delays.¹⁶ Findings have shown that misdiagnosis of EPs is not uncommon in developing countries, because of the paucity of improved diagnostic facilities.³¹ Without investigative procedures, the accuracy of clinical diagnosis alone in ectopic gestation is about 50%.^{32,33} Improving the clinical acumen of medical personnel through continuous professional development, regular emergency drills, and availability of advanced diagnostic facilities will assist in reducing the problem.

Other hospital-based factors responsible for delay in obtaining care were difficulty in getting blood, time lapse in obtaining ultrasound report, and busy operating rooms. Although these did not statistically predict phase 3 delay,

improvement in these areas will assist in ensuring efficient health care delivery.

The study is not without limitations. Since data were collected from case records, detailed information about difficulty encountered in reaching health facilities (phase 2 delay) was somewhat unavailable. Aside from this, it is also possible that other causes of delay could have been missed, and in some cases there might have been more than one reason for the delay in seeking and/or obtaining care. For future research, interviews could be designed to determine the direct and remote causes of delay in seeking help among women with EPs. Clinical and sociodemographic risk factors for EPs and RTPs in our environment can equally be identified through prospective multicenter case-control studies.

Conclusion

RTPs continue to contribute to maternal morbidity and mortality in our environment, primarily because of delay in seeking care by patients and challenges with providing

Table 4 Predictors of delay in obtaining health care

Issues	Delay in obtaining care, n (%)		χ^2	P-value
	Yes	No		
Problem of funds			7.354	0.005*
Yes	25 (100)	0		
No	50 (75.8)	16 (24.2)		
Difficulty getting blood			2.131	0.352
Yes	9 (100)	0		
No	66 (80.5)	16 (19.5)		
Misdiagnosis			5.824	0.018*
Yes	21 (100)	0		
No	54 (77.1)	16 (22.9)		
Awaiting USS confirmation			3.530	0.119
Yes	14 (100)	0		
No	61 (79.2)	16 (20.8)		
Busy operating room			1.370	0.586
Yes	6 (100)	0		
No	69 (81.2)	16 (18.8)		

Note: *P<0.05.

Abbreviation: USS, ultrasound scan.

care at health facilities. Women's educational and financial empowerment is basic, but importantly free health policy for obstetric and gynecological emergencies is needed in our setting to reduce mortality. In addition, even distribution of well-equipped health facilities with motivated and qualified personnel will ensure reduction in misdiagnosis and delay in obtaining much-needed care.

Disclosure

The authors report no conflicts of interest in this work.

References

- Farquhar CM. Ectopic pregnancy. *Lancet*. 2005;366(9485):583–591.
- Sivalingam VN, Duncan WC, Kirk E, Shephard LA, Horne AW. Diagnosis and management of ectopic pregnancy. *J Fam Plann Reprod Health Care*. 2011;37(4):231–240.
- Poonam Y, Uprety D, Banerjee B. Ectopic pregnancy – two years' review from BPKIHS, Nepal. *Kathmandu Univ Med J (KUMJ)*. 2005;3(12):365–369.
- Tenore JL. Ectopic pregnancy. *Am Fam Physician*. 2000;61(4):1080–1088.
- Majhi AK, Roy N, Karmakar KS, Banerjee PK. Ectopic pregnancy – an analysis of 180 cases. *J Indian Med Assoc*. 2007;105(6):308–314.
- Rajkhowa M, Glass MR, Rutherford AJ, Balen AH, Sharma V, Cuckle HS. Trends in the incidence of ectopic pregnancy in England and Wales from 1966 to 1996. *BJOG*. 2000;107(3):369–374.
- Anorlu RI, Oluwole A, Abudu OO, Adebajo S. Risk factors for ectopic pregnancy in Lagos, Nigeria. *Acta Obstet Gynecol Scand*. 2005;84(2):184–188.
- Jurkovic D, Wilkinson H. Diagnosis and management of ectopic pregnancy. *BMJ*. 2011;342:d3397.
- Thonneau P, Hijazi Y, Goyaux N, Calvez T, Keita N. Ectopic pregnancy in Conakry, Guinea. *Bull World Health Organ*. 2002;80(5):365–370.
- Ali AA, Abdallah TM, Siddig MF. Diagnosis of ruptured ectopic pregnancy is still a challenge in Eastern Sudan. *Afr J Reprod Health*. 2012;15(4):106–108.
- Foumane P, Mboudou ET, Dohbit JS, Ndingue SM, Tebeu PM, Doh AS. Conservative treatment of ectopic pregnancy in a sub-Saharan African setting. *Trop Doct*. 2011;41(2):79–81.
- Ikeme AC, Ezegwui HU. Morbidity and mortality following tubal ectopic pregnancies in Enugu, Nigeria. *J Obstet Gynaecol*. 2005;25(6):596–598.
- Musa J, Daru PH, Mutihir JT, Ujah IA. Ectopic pregnancy in Jos, Northern Nigeria: prevalence and impact on subsequent fertility. *Niger J Med*. 2009;18(1):35–38.
- Igberase GO, Ebeigbe PN, Igbekoyi OF, Ajufoh BI. Ectopic pregnancy: an 11-year review in a tertiary centre in the Niger Delta. *Trop Doct*. 2005;35(3):175–177.
- Priuli G, Darate R, Perrin RX, Lankoande J, Drouet N. Multicentre experience with a simple blood salvage technique in patients with ruptured ectopic pregnancy in sub-Saharan West Africa. *Vox Sang*. 2009;97(4):317–323.
- Hamura NN, Bolnga JW, Wangnapi R, Horne AW, Rogerson SJ, Unger HW. The impact of tubal ectopic pregnancy in Papua New Guinea – a retrospective case review. *BMC Pregnancy Childbirth*. 2013;13:86.
- Leke RJ, Goyaux N, Matsuda T, Thonneau PF. Ectopic pregnancy in Africa: a population-based study. *Obstet Gynecol*. 2004;103(4):692–697.
- Obed S. Diagnosis of unruptured ectopic pregnancy is still uncommon in Ghana. *Ghana Med J*. 2006;40(1):3–7.
- Cantwell R, Clutton-Brock T, Cooper G, et al. Saving mothers' lives: reviewing maternal deaths to make motherhood safer: 2006–2008. The eighth report of the confidential enquiries into maternal deaths in the United Kingdom. *BJOG*. 2011;118 Suppl 1:1–203.
- Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc Sci Med*. 1994;38(8):1091–1110.
- Abbas AA, Walker GJ. Determinants of the utilization of maternal and child health services in Jordan. *Int J Epidemiol*. 1986;15(3):404–407.
- Cleland JG, van Ginneken JK. Maternal education and child survival in developing countries: the search for pathways of influence. *Soc Sci Med*. 1988;27(12):1357–1368.
- Lasker JN. Choosing among therapies: illness behavior in the Ivory Coast. *Soc Sci Med Med Psychol Med Sociol*. 1981;15A(2):157–168.
- Tanner JL, Cockerham WC, Spaeth JL. Predicting physician utilization. *Med Care*. 1983;21(3):360–369.
- Habib OS, Vaughan JP. The determinants of health services utilization in southern Iraq: a house-hold interview survey. *Int J Epidemiol*. 1986;15(3):395–403.
- Rahaman MM, Aziz KM, Munshi MH, Patwari Y, Rahman M. A diarrhea clinic in rural Bangladesh: influence of distance, age and sex on attendance and diarrheal mortality. *Am J Publ Health*. 1982;72(10):1124–1128.
- Stock R. Distance and the utilization of health facilities in rural Nigeria. *Soc Sci Med*. 1983;17(9):563–570.
- World Health Organization. *Essential Obstetric Functions at First Referral Level to Reduce Maternal Mortality: Report of a Technical Working Group*. Geneva: WHO; 1986.
- Abu-Zeid HA, Dann WM. Health services utilization and cost in Ismailia, Egypt. *Soc Sci Med*. 1985;21(4):451–461.
- Ekwempu CC, Maine D, Olorukoba MB, Essien ES, Kisseka MN. Structural adjustment and health in Africa. *Lancet*. 1990;336(8706):56–57.
- Olatunbosun OA, Okonofua FE. Ectopic pregnancy – the African experience. *Postgrad Doct Afr*. 1986;8(3):74–78.
- Cunningham FC, MacDonald PC, Gant NF, Leveno KJ, Gilstrap LC 3rd. Ectopic pregnancy. In: Cunningham FC, editor. *Williams Obstetrics*. 19th ed. London: Prentice-Hall; 1993:691–715.
- Speroff L, Glass RH, Kase NG. Ectopic pregnancy. In: Speroff L, Glass RH, Kase NG, editors. *Clinical Gynecologic Endocrinology and Infertility*. 5th ed. Baltimore: Williams and Wilkins; 1994:947–964.

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