

Original Article

Incidence of Instrument Fall During Caesarean Section: An Enigma

Joshi C¹, Joshi AK², Pal B³, Mohsin Z⁴, Sharma R⁵

Objective: The aim of the study was to analyse and compare statistically the incidence of accidental fall of instruments during elective and emergency caesarean section. **Material and Methods:** A prospective study was carried out at (V. C. S. G. G. Medical Sciences and Research Institute) Srinagar, Pauri Garhwal, India over a period of 24 months. The instrument fall during elective and emergency caesarean sections was observed. The observer counted the number of times an instrument fell during surgery. The personnel responsible were identified. A note of the nature of instrument falling was made. **Results:** We observed 362 surgeries which included 242 emergency caesarean sections and 120 elective caesarean sections. There were a total of 159 falls. Falls were classified as major and minor. There were 22 falls (18.33%) during elective caesarean sections and 137 falls (56.61%) during emergency caesarean sections. There were 53 major and 106 minor falls. Two or more falls were noted in 31 surgeries. In 96 instances (60.37%) the operating surgeon was responsible for the fall. In 37 cases (23.27%) assisting surgeon and in 17 cases (10.69%) the scrub nurse was responsible for the fall of the instruments. Nine falls (5.66%) were unaccountable. Most falls in elective caesarean section were in later half of the surgery while in emergency caesarean section, they were before and during the extraction of the baby. The surgeries were delayed, on an average by 5.7 minutes after a major fall of an instrument. **Conclusions:** Falling of instruments in the theatre is a common problem all over the world. This leads to increase in operating time, more resources and quality compromise. The operating surgeon was mainly responsible for the fall. A short training programme in instrument handling should be conducted for operating surgeons which may be helpful in preventing such avoidable falls.

Keywords: Caesarean section; instrument fall; operation room; sterilisation.

Introduction

Falling of instruments during caesarean sections is a very common problem in Obstetric and Gynecological operating rooms. Many times it can be a source of considerable embarrassment and agony to the operating surgeon or the scrub nurse. This study aimed at evaluating the problem and its causes on a systematic basis. The problem leads to increased operating time, extra resources to sterilize the fallen instrument and in many cases quality compromise by doing surgery with whatever instruments are available.

Material and Methods

This was a prospective study, conducted over a period of 24 months from February 2009 to January 2011 at V. C. S. G. G. Medical Sciences and Research

Institute Srinagar, Pauri Garhwal, India. This is a tertiary referral centre with a well equipped operation room for obstetrical and gynaecological surgeries. We observed 362 randomly chosen emergency and elective caesarean sections. There were 120 elective and 242 emergency caesarean sections which were observed. The falls were grouped into major or minor depending on the delay in surgery due to instruments falling on the floor. The instrument fall which resulted in break in surgery was grouped as a major fall. The rest of the falls were assigned as minor. During observation the operating surgeon, scrub nurse or the assistants were unaware of the study. The data were recorded on a proforma by an assigned floor nurse in the operating room. The observer made a note of the time of fall and the number of times an instrument fell during surgery. The

1. Dr Chitra JOSHI, (Assistant Professor)
2. Dr. Anil Kumar JOSHI, (Assistant Professor)
3. Dr Bawani PAL, Consultant
4. Dr. Zehra MOHSIN, (Assistant Professor)
5. Prof. Rajyashri SHARMA, VCSGG Medical Sciences & Research Institute, Srinagar Garhwal, Pauri Garhwal, Uttarakhand, India.
JN Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India.

***Corresponds to:** Dr. Chitra Joshi, Assistant Prof. of Obstetrics & Gynecology, H.N.B. Base & Teaching hospital, P.O. Srikot, Srinagar Garhwal, Pin-246174. VCSGG Medical Sciences & Research Institute, Srinagar Garhwal, Pauri Garhwal, Uttarakhand, India. **E-mail: cjobs@hotmail.co.in**

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personnel involved in the instrument fall during surgery were identified. A note of the nature of the instrument falling was also made. The implication of the fall and delay in surgery thereof was noted. It was also analysed whether the emergency caesarean sections were done in succession. This study design was approved by 'Ethics Committee' of VCSGG Medical Sciences and Research Institute.

Results

A total of 362 caesarean sections were observed during the study. There were a total of 159 falls with 53 major and 106 minor falls. There were 22 falls (18.33%) during elective caesarean sections and 137 falls (56.61%) during emergency caesarean sections. In elective caesarean sections 3 major falls (13.63%) and 19 minor falls (86.36%) occurred, while in emergency caesarean sections 50 major falls (36.49%) and 87 minor falls (63.50%) were noted - (Table I). In 31 surgeries 2 or more than 2 instruments fell. In 96 instances (60.37%) the operating surgeon was responsible for the fall. In 37 cases (23.27%) assisting surgeon and in 17 cases (10.69%) of the instances the scrub nurse was responsible for the fall of the instruments. In 9 falls (5.66%) nobody was apparently responsible for the fall, so these falls were grouped as unaccountable - (Table II).

The average time for elective caesarean sections was

40 minutes (ranges from 35 to 45 minutes). It was 25 minutes (20 min to 30 min) for emergency caesarean sections. The first fall of the instruments occurred at an average of 15 minutes and 5 minutes after the start of the elective and emergency procedures, respectively. An average delay of 5.7 minutes was noted after a major fall of the instrument.

The type of the fallen surgical instruments was also noted. Out of a total of 159 instruments falling on the floor, there were 70 falls involving Haemostats (used for bleeders, blunt dissection), 23 Kocher's clamp, 20 scissors, 20 needle holders, 10 Allis forceps, 11 Tooth forceps, 3 scalpels and 2 Doyen's retractor. There was no injury noted to the operating staff because of any fall.

The incidence of fall was high when surgeries were done back to back. This was implicated due to surgeon's fatigue. When caesarean sections were done in succession, the incidence of instrument fall was 19.70% (27/137) during first cases. In second caesarean sections the incidence of instrument fall was 31.39% (43/137). While when the cases done were third or more in a row the incidence of fall was 48.91% (67/137) - (Table III).

Table I: Instrument fall in type of caesarean section.

Caesarean section	No. of Instrument fall				Total falls
	Major		Minor		
	Number	%	Number	%	
Elective (n= 120)	3	13.63	19	86.36	22
Emergency(n=242)	50	36.49	87	63.50	137
Total	53		106		159

Table II: Person responsible for fall of instrument.

Person responsible	No. of falls	Percentage
Surgeon	96	60.37
Assistant surgeon	37	23.27
Scrub nurse	17	10.69
Unaccountable	9	5.66
Total	159	100

Table III: Incidence of instrument fall in back to back surgeries.

Order of back to back surgeries	Number of falls (n=137)	Percentage
1 st	27	19.70
2 nd	43	31.39
3 rd or more	67	48.91

Discussion

To the best of our knowledge, no research work to evaluate the cases and implications of the instrument fall in gynaecological and obstetrical surgery has been published. The studies evaluating slipperiness and subsequent fall of subjects on floor have led to the development of slip measurement methods, which can be applied in a modified manner to studies similar to ours^{1,2}.

Our study concluded that gynaecological instruments fall in one-sixth of elective caesarean sections and in approximately every second emergency caesarean sections. The operating surgeon and his/her first assistant were responsible for 83.64% of instrument falls in the operating room. This calls for a need for better training in instrument handling for the obstetric and gynaecologic trainees.

Most falls in elective caesarean section were in later half of the surgery, while in emergency caesarean sections they were prior to and during the extraction of the baby. Moreover, surgeon fatigue after back to back surgeries during an obstetrical emergency duty and subsequent loss of concentration is a known phenomenon, documented by many authors³. This fact is also evident in our study.

The American College of Obstetricians and Gynaecologists recommends that in an emergency, obstetrical units should be capable of initiating a caesarean section within 30 minutes of a decision to perform the procedure.⁷ In Germany, the recommendation is, in an emergency, the caesarean section should be initiated within 20 minutes. Worldwide, many obstetrical units are unable to routinely achieve a 30-minute decision-to-incision interval^{4,5,6}.

There are no randomized clinical trials demonstrating that the faster a caesarean section is performed, the better the maternal and fetal outcome⁷. Thus the initial 5-10 minutes haste can be avoided to decrease the incidence of instrument fall, if not to prevent it.

The type of instrument falling during caesarean sections indicates that falls are more common with smaller instruments (like haemostats). Simple measures to prevent fall of instruments and their easy transfer between the scrub nurse and the surgeon have been studied and used for microsurgical instruments^{8,9}. Studies say that delays in operating room is sign of an imperfect system and equipment failure is one of the causes and this can be applied to our study in a modified form¹⁰. The delay in surgery due to instrument fall has been reported by other studies and local hospital based measures are recommended to prevent this problem¹¹.

Studies emphasizing good instrument handling in the operating room on part of the scrub nurse are available^{12,13,14}. The incidence of instruments falling directly as a result of the scrub nurse was very low in our study and is comparable to other study¹¹.

By employing good surgical practices we can reduce avoidable falls. This would directly reduce operating time and anaesthetic requirement. Moreover instruments last longer and fewer resources are used during surgery decreasing surgical cost. The use of good quality standard instruments is very important. In addition, it is imperative to identify the degree of urgency and maintain effective communication and coordination between various members of the healthcare team.

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