

# **A Comprehensive Study and Meta Analysis of the Effect of Interaction Force Technology on Decreasing Recurrent and Significant Problems of Atrial Fibrillation Excision**

**1Dr Mujahid Rasheed, 2Sajjad Ahmed Khan, 3Muhammad MuqetNaeem, 4Dr IqraShoukat, 5Dr AroobaNazir, 6Dr Imran Sabir**

1Services Hospital Lahore, rasheedmujahid88@gmail.com

2Senior House Officer in Community Medicine Shaikh Zayed Hospital LAHORE  
sajjad.09148@gmail.com

3House Officer, Shaikh Zayed Hospital Lahore, muqt995@gmail.com

4Medical officer, Family medicine, BHU Jhandala, Rawalakot, Iqrashoukatkhan965@gmail.com

5House Officer, Surgical Department, SKBZ/CMH Muzaffarabad, Muzaffarabad,  
aroobanazir6@gmail.com

6Medical Officer at Muzaffarabad General Hospital, Muzaffarabad, qaziimran23@gmail.com

**Corresponding Author:Dr Muhammad Umer, Consultant Cardiologist, Cardiology Department, DHQ Hospital Sheikhpura, doctor.m.umer@gmail.com**

## **ABSTRACT:**

**Aim:**For atrial fibrillation, kinematic monitoring could be beneficial when radial pulmonary vein isolation is performed (AF). As a result, the effectiveness and security of a CF catheter in the treatment of AF were evaluated. Studies with randomization and control or studies with non - randomized observations.

**Methods:**We examined PubMed, EMBASE, Cochrane Library, Wan fang Data, and Pakistan National Putting Information for medical studies assessing ablation of AF with CF-sensing or conventional non-CF catheters. Our current research was conducted at Cardiology Hospital Multan from May 2020 to April 2021.

**Results:**There were 23 studies in all. After an 11-month period, recurrent rates were decreased by 35.2 percent with CF sensing catheters and by 44.6 percent with NCF sensing catheters [RR = 0.83; 96% sample size (CI), 0.74-0.94; and p=0.06]. The sharp reconnection of the PV system was also a factor here.CF sensor catheter use resulted in a significant reduction in mortality (11.2 vs. 25.3 percent; risk ratio = 0.46, 96% confidence interval = 0.33-0.64; p0.06) and major complications (2.9% vs. 4.2 percent; odds ratio = 0.55, 96% confidence interval = 0.38-0.96; p0.06) compared to NCF sensor catheter use.Procedural parameters such as regulatory requirements.

**Conclusion:**The use of catheters with CF shaved down considerable amounts of operation time, ablation time, fluoroscopy length, and radiation dosage. A 12-month follow-up study found that catheter ablation of AF using a CF-sensing catheter decreased the incidence of severe problems and produced superior results compared to NCF-sensing catheters.

**Keywords:**Interaction Force Technology, Decreasing Recurrent, Atrial Fibrillation Excision.

## **INTRODUCTION:**

An ablation technique for atrial fibrillation, the most common persistent heart arrhythmia, has been shown innocent and positive in the substantial sum of patients throughout the world. It has been proven that ablation treatments for AF are innocuous and positive in the substantial sum of individuals across the world [1]. Even after catheter ablation, the incidence of resurgence of AF is still very high. PVC reconnection owing to poor ablation lesions has been found as a key reason for atrial fibrillation to return after ablation [2]. There was a return of atrial fibrillation, and catheter-tissue engagement is critical for successful ablation lesions. For

preventing problems, extremely accurate of the Lesions and sympatheticconfines of connection force are essential [3]. Novel RF catheter ablation with CF detection has also been touted in recent years as possibly effective for ablating. Fiber-optic or magnetic sensors are used to monitor CF ablation between all the catheter tip and the tissue at the catheter tip. It took ex vivo models and exploratory in vivo investigations to test the safety of catheters with CF sensors before they were utilized on humans [4]. When utilizing an HF- rent for catheter ablation, prior research has demonstrated a significant correlation between CF and lesion size. A debate continues, however, about the effectiveness and safety of CF-sensory catheters, notably in terms of decreasing complications with the meta-analysis, the researchers intended to measure effectiveness and security of catheter ablation of atrial fibrillation using CF sensing catheters [5].

## METHODOLOGY:

Inclusion criteria for research would include: Human research on patients throughincontrollable atrial fibrillation or determined atrial fibrillation and people through paroxysmal atrial fibrillation or chronic atrial fibrillation. Individuals over age of 18 were studied. Our current research was conducted at Cardiology Hospital Multan from May 2020 to April 2021. This study did not include comparison studies, case reports, editorials, or reviews. Meta-analysis was conducted according to PRISMA standards. Study features included adequate sequencing, hidden assignment, attribution less than 16 percent blinded evaluation, intent-to-treat analysis, and sufficient AF monitoring in the single trials examined. In addition, the references were evaluated as well as the data, which was separately summarized by two reviewers. According to Cochrane Rev Man version 6, the outcomesremained expressed as weighted averagevariances and comparativedanger for incessant and dichotomous results, correspondingly. This method was used when heterogeneity was moderate or high ( $I^2 > 54\%$ ). If  $I^2$  was less than 52%, the fixed-effects model was employed. Standardized Medical Dose (SMD) was performed to calculate radiation doses from among considered studies, as different optical units had already been employed. The Cochran's Q statistic and  $I^2$  index were used in the previous study to measure the heterogeneity between studies. A p-value of 0.06 was utilized for all statistical tests.

## RESULTS:

196 references came from PubMed, 168 from EMBASE, and 17 from Cochrane Central Register. Three hundred and twenty-nine papers were eliminated. Detailed reviews were conducted on the complete manuscripts of the remaining 49 studies, and 29 were eliminated. It was determined that between 17 and 37 clinical trials evaluated security and effectiveness of CF-sensing catheters with NCF-sensing catheters during AF ablation, including four RCTs, two retrospective cohort studies, and thirteen non-randomized controlled trials. Figure 1 provides information pertinent to the literature search. Table 1 provides a summary of the patient's confounding factors. There was a total of 4065 patients enrolled in the CF- and NCF-sensor catheter groups. Patients with PAF and/or Per AF subcategories were studied in ten different trials, and essential data is gathered to assess the effectiveness and safety of the treatment amongst the three categories. Nevertheless, in Per AF subgroup, AF recurrent was statistically lesser in CF group than in NCF group (48.8% vs. 56.9%;  $RR=0.94$ , 96 percent CI, 0.78–1.13,  $I^3=54.4\%$ ;  $p=0.45$ ).

**Table 1:**

Study	AF	PAF	PerAF	Mean Age	Male	Type
Marijon 2016	62	NR	NR	52.4+9/41.5+9	28	Prospective Non-randomized research
Aqsa 2016	448	421	325	54.2+6/32.8+8	154	Retrospective Case study
Jummana 2014	774	621	27	62.1+7/41.3+4	351	Retrospective Case study
Haider 2012	68	54	NR	71.5+1/42.5+6	NR	Prospective Non-

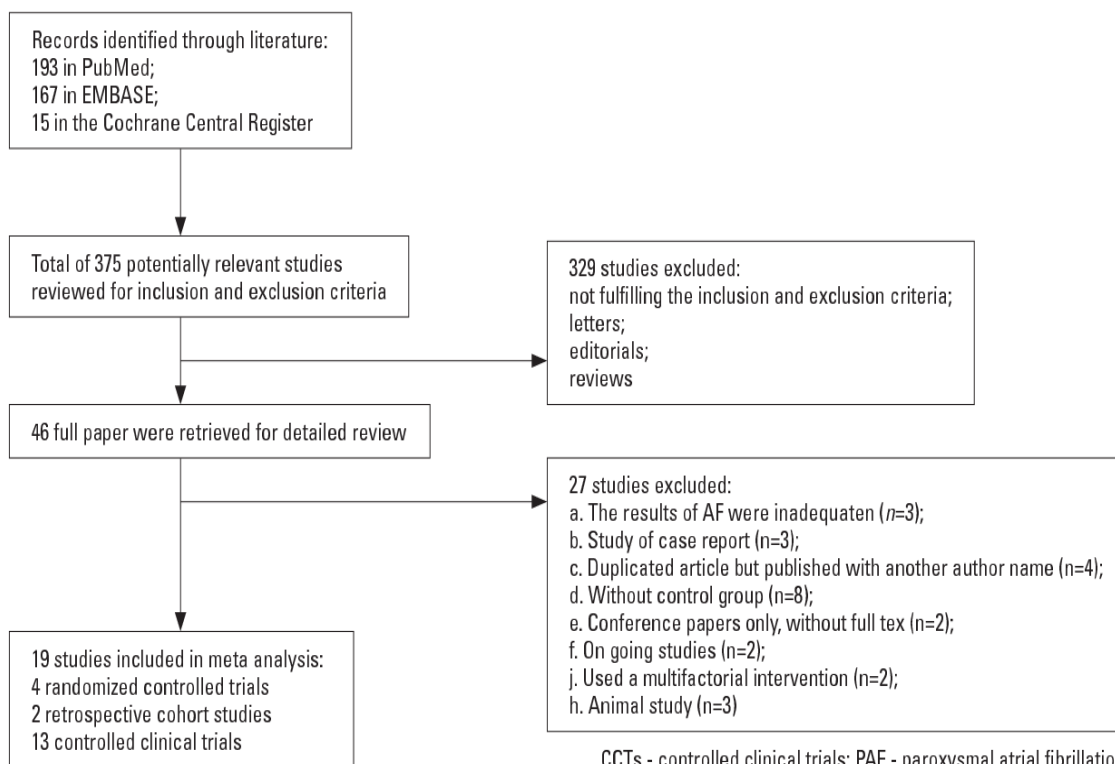
						randomized research
Maternaik 2013	127	NR	41	53.4+1/35.7+9	14	Prospective Non-randomized research

**Table 2:**

Study	AF	PAF	PerAF	Mean Age	Male	Type
Taylor 2018	152	84	78	53.8+4/49.1+2	29	Prospective Non-randomized research
Saani 2010	95	62	33	51.3+7/33.4+9	95	Retrospective Case study
Joseph 2012	127	35	92	63.2+8/42.4+5	35	Retrospective Case study
Ismael 2009	354	249	105	72.6+0/46.4+8	24	Prospective Non-randomized research
Matak 2016	147	74	73	55.1+1/36.5+8	15	Prospective Non-randomized research

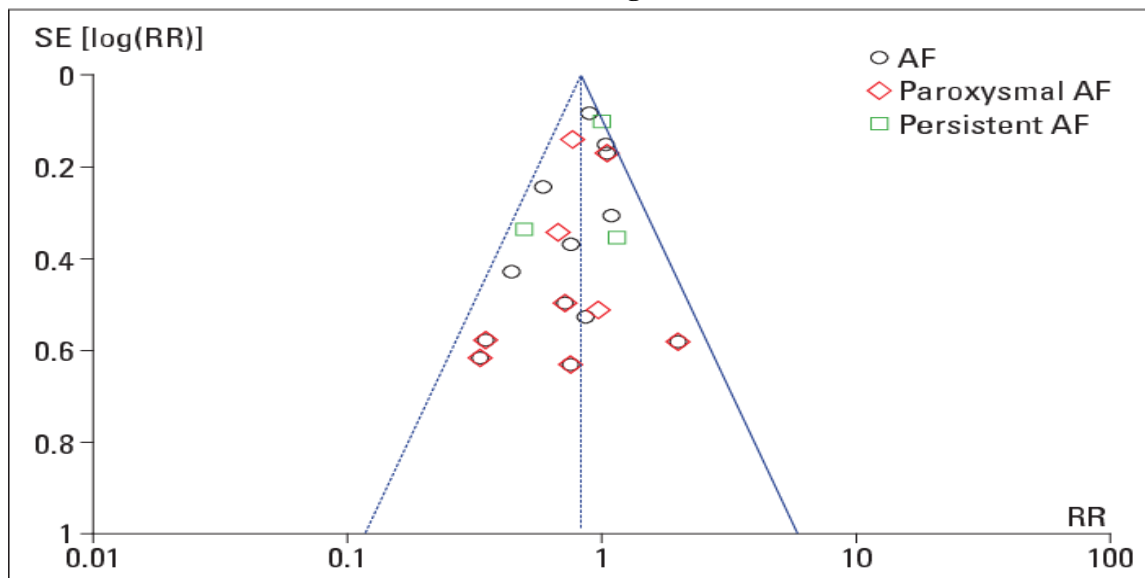
The rate of acute PV reconnect was also studied in seven other trials, and no indication of heterogeneity was identified (I3=0%). Comparatively, using catheters that measure the amount of carbon dioxide (CF) in the blood, the acute PV reconnection rate was much lower than when using NCF-measuring catheters (10.2 percent vs. 25.3 percent RR=0.46 96 percent CI, 0.34–0.64 I4 =0 percent P=0.00003; Fig. 3b).

**Figure 1:**



**Figure 1.** Flow diagram of the literature search stages

**Figure 2:**



**Figure 2.** Funnel plot for the assessment of publication bias for the pri-

The prevalence of significant problems was examined in studies reviewed, as shown in Figure 5, and no indication of heterogeneity was identified ( $I^2 = 0\%$ ). When it came to the major problems, the CF group was substantially less likely to experience them than the NCF group (1.8 percent as opposed to 4.2%;  $OR=0.58$ ; 96 percent CI, 0.38–0.96;  $I^2=0$  percent, and  $p=0.04$ ). Number-wise, the number of cases of mild problems was significantly lower in the NCF group (5.4 percent vs. 5.9 percent;  $OR=1.23$ ; 96-percent CI, 0.79–1.93), although the results were not statistically significant ( $p=0.38$ ).

## DISCUSSION:

It was shown in the current meta-analysis that, in comparison to AF and PAF ablation conducted with NCF-sensing catheter, any usage of CF- sensing catheters caused in greater inferior rates of acute PV reconnection and AF chronicity even throughout 12-month follow-up, along with lesser major side effects and process features pertaining to security [6]. A number of variables, particularly tissue depth, electrode tissue interface temperature, and electrode tip-tissue contact pressure, influence the duration of the conduction block. Due to inadequate Cf, non-transmural lesions are not effective and allow for subacute PV reconnection once the edema subsides (2), while undueCf might induce collateral tissue damage. Themixture of subjective criteria and objective ablation para-meters has been used in the past to determine if the catheter tip is adequately in touch with the tissue. Due to their unreliability and difficulty in application, these characteristics are poor predictors [7].It is now possible to use catheters that can measure the amount of CF in the blood. Ongoing catheter-tissue CF may be monitored with these, ensuring not only approximate quantities catheter insertion, but also real-time detection of catheter dislodging/sliding [8]. It was shown that CF technology resulted in lower rates of acute PV reconnection and AF recurrence than NCF. 39) showed that a CF criterion of >12g predicts total lesion with good accuracy. As Reddy et al. shown in the TOCCASTAR trial, PV ablation through an ideal CF (90 percent of lesions produced through an optimal CF of 10 g) caused in a considerably better achievement rate than PV isolation throughthe non-optimal CF did [9]. According to the EFFICAS II research, thegoal CF of 20 g was established for PV isolation in PAF patients, with the range 10–30 g showing a higher success rate for PV isolation than a similar procedure lacking recommendations [10].

## CONCLUSION:

On average, the 12-month results of ablation with CF-detecting catheters are greater than those with NCF-detecting catheters. A CF-sensing catheter had a reduced symptoms of severe problems than an NCF-sensing

catheter, according to a new study. By means of an optimum average CF of 19.4 g remained also related by better achievement rates and reduced difficulty rates, according to the metanalysis. In order to ascertain if catheter ablation employing an enhanced CF enhances longstanding health outcomes and to define precise optimum CF to remain utilized in distinct individual subgroups, randomized trials are necessary.

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